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KANSAS.

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FACTS ABOUT
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FARM LANDS,
GRAZING LANDS,
FRUIT LANDS.

THE UNSURPASSED AND LIMITLESS RESOURCES
OF THE GREAT CORN AND WHEAT
PRODUCING STATE.

WITH THE COMPLIMENTS OF THE
GENERAL PASSENGER DEPARTMENT
—OF—
THE MISSOURI PACIFIC RAILWAY COMPANY.

A COMPREHENSIVE
STATISTICAL DESCRIPTION OF
THE STATE OF KANSAS, COMPILED
FROM OFFICIAL REPORTS FOR
THE YEAR 1891.

WOODWARD & TIERNAN PRINTING CO., ST. LOUIS.

KANSAS.

ITS LOCATION IN THE AMERICAN UNION.

A GENTLY undulating plain, 210 miles in width from north to south, and 400 miles long from east to west; this is the first thing to be said about the great agricultural State which lies in the very heart of the American Continent. The plain slopes from west to east at an average of about seven feet to the mile; there is also an inclination from north to south, as indicated by the water courses which bear generally in a southeasterly direction. The mouth of the Kansas river, on the eastern boundary, is 750 feet above the sea level; the average altitude of the western boundary is about 3,500 feet.

The State lies between 37° and 40° north latitude, and between 94°, 38′ and 102° west longitude.

Kansas is distinctively a prairie State; its broad surface is diversified by an endless succession of valleys and woodlands. The Great Central valley is traversed by the Kansas, or Kaw, river, which, inclusive of the Smoky Hill branch, extends the entire length of the State. Another broad valley is formed in the southern half of the State by the Arkansas river, while numerous lateral valleys on the north are formed by minor streams. In the southeastern portion lies the important Neosho valley and the smaller valleys of the Osage and Verdigris. In the extreme southwest and along the southern boundary are the valley of the Cimarron and a network of the southern tributaries of the Arkansas. The northeastern quarter is enriched by numerous small affluents of the Missouri. The streams of Kansas are generally fed by perennial springs, and, as a rule, the eastern and middle portions of the State are well watered. The western part is more elevated and water is less abundant.

The surface and soil characteristics, elevations, and variations in climate divide the State naturally into three distinct zones or belts, dignified as Eastern, Central and Western Kansas. Eastern Kansas, in part bordering on the Missouri river, is generally high, rolling prairie, hilly and broken in places, but traversed by wide and beautiful valleys, through which timber-fringed streams find their way eastward and southeastward. Near the western edge of the eastern belt, the limestone formation extending north and south through the State marks the line between the high rolling prairies of Eastern Kansas and the gently rolling and almost unbroken surface of the great prairies of Central Kansas, so noted for the great depth, uniformity and richness of its soil, and the small percentage of waste land.

The State contains 82,000 square miles; a little less than Great Britain; larger than New England; twice as large as Kentucky, or Ohio, or Indiana, and larger than Indiana and New York combined.

The exact geographical center of the United States, exclusive of Alaska, lies near Manhattan, in Riley county, Kansas.

The whole surface is a continuation of "the plains" which stretch from the Rocky Mountains eastward through Colorado. The north line, along the State of Nebraska is considerably higher than its southern boundary on the line of the Indian Territory. Hence, in traveling westward we ascend continually. At the Kaw river, at Kansas City, we are only 760 feet above the sea level. On the western boundary of the State, where we cross into Colorado, we are 4,000 feet above the sea, so that in a journey of a little over four hundred miles, we have climbed a hill 3,240 feet in height. And yet there are no mountains in all the broad State of Kansas. It is a prairie State, an agricultural State.

Here, then, at the very outset, Kansas lays claim for priority in the sisterhood of States. The ordinary observer, possessing only a superficial knowledge of the economic conditions which govern the settlement and industrial development of the country, will see at a glance, that a State so advantageously situated, must, if soil, climate, or other factors prove favorable, draw to itself a large quota of the constantly increasing immigration which is rapidly flowing into the country. The value of land depends entirely upon the number of people who want land. There are now less than twenty persons to the square mile in Kansas, including the rural and urban population. As population increases, land values rise; we all know this to be a fact, and we also know that in the western half of the United States, the free Government land which has heretofore been at the disposal of new settlers is rapidly diminishing in quantity. Further on, it will be seen that Kansas soil and climate fulfill every requirement—that in this respect at least, nothing more could be desired by the farmer, the stock raiser or the fruit grower, and as population is steadily flowing westward, and as the cities, towns and villages of Kansas are rapidly filling up, and farm lands are being brought under cultivation, it follows that the State of Kansas now offers to the settler who finds the conditions which surround him in the older States growing each year more and more undesirable, the best possible opportunity for bettering his condition.

KANSAS
SCENERY.
Missouri Pacific Ry.

The Government no longer has first-class agricultural lands to offer to the homesteader, the free lands are, speaking generally, exhausted, for if one now desires to take a homestead, he must go so far away from markets, from churches, schools and civilization that the land is practically worthless. He will find, too, that much if not all of the land now nominally open to the homesteader and pre-emptor lies within the arid districts where expensive irrigation canals must be constructed before the settler can raise a crop. Kansas then, offers that which no other Western State can offer in greater abundance or under freer conditions—a large area of first-class lands to be had at nominal prices. Climate, soil and moisture, assure the husbandman of success, while the location of the State and the comparatively sparse population which now finds a home within its borders, makes "assurance doubly sure," that land values there will steadily rise to the enrichment of those owners who secure homes or farms for themselves at once.

For the investor or the actual settler, the best lands for the least money are to be found in Kansas. No other Western State can begin to compare with Kansas in this particular, as the reader will discover as he considers the figures which he will find further on, telling of the capabilities of the State as an agricultural and industrial factor of the Union.

The natural resources of the State are wonderful; it is underlaid with limestone of a superior quality which is used for all classes of building at home, and is shipped abroad, and used for the erection of buildings in the cities of the neighboring States.

A large area of the State is underlaid with an excellent quality of bituminous coal.

The State is central, it is "on the road to California" and the Orient; it is crossed by several of the greatest railroad systems on the continent, and is destined to be the broad highway for numerous trans-continental lines.

The growth of the State has been phenomenal; twenty-five years ago there was comparatively nothing west of the Missouri, and very little west of the Mississippi. Where now fair farms and beautiful groves of shade and fruit trees stand to gladden the eye, and tell of comfortable and happy homes, the Indian and the buffalo held full possession of the soil. There are now busy, bustling, thriving cities in Kansas; churches, schools, electric street car lines, factories, mills and commercial exchanges; marts of trade whose transactions run into the millions—and yet twenty-five or thirty years ago the first footfall of civilization had not been heard, where now tower the imposing walls of the warehouse, the grain elevator and the mill.

And yet there are only a million and a half of people in all of Kansas. The ground has scarcely been touched by the hand of man—only about twenty people to the square mile, and this includes both the dwellers in cities and the dwellers on farms—there is

"Room for millions more."

And opportunity for millions more. Where now there are only broad stretches of prairie grass and sunshine, countless homes will rise; countless villages and towns, with schools and churches, factories and markets will be built.

It is the destiny of Kansas to be a great State.

Her geographical position.

Soil.

Climate.

History.

The character and energy of her people.

Everything combines to make her great in the nation, and worthy of the love of her children who have rescued her fruitful soil from the savage and the wild beast, and caused her valleys to blossom as the rose.

KANSAS' PLACE IN HISTORY.

This is not a history. This book is intended to serve as a suggestion for homeseekers, a pointer for men who are seeking greener fields and newer pastures, in which they may build homes and rear families under the protecting shield of a free government. And because Kansas has in its history much that proves its founders to have been men who loved home, and peace, and liberty dearly enough to be willing to sacrifice even the very things which they loved most, in order that their children might enjoy in peace that which they fought for, a brief outline of this history will not be out of place here. But it is only an outline; just enough to give a hint to the reader of what manner of men they were who laid the foundation stones, and began to lay the walls upon which the great edifice, called the Commonwealth of Kansas, now stands disclosed.

The name Kansas is of Indian origin and means "smoky water." The State is a part of that great tract of country purchased by the United States from France in 1803, known as the Louisiana Purchase. Prior to 1854 it was held by various Indian tribes, some native, and others which had been removed from the older States. It was organized and opened for settlement as a territory, by act of Congress in May, 1854, in the midst of a heated contest on the slavery question, in which each side vigorously contested for the control of the new territory; and thus it was that Kansas became the scene of the premonitory outbreaks which preceded the Civil War. Before the formal opening of that war, societies were organized by the rival settlers and their friends in the States on both sides of the great questions at issue, and even rival legislatures were elected and convened. The discussion frequently resulted in personal violence, and the greatest excitement prevailed till the breaking out of the Civil War. Kansas came into the Union as a State in January, 1861. In August, 1863, the city of Lawrence was sacked and burned.

CLIMATE.

The geographical position of Kansas is an unanswerable argument in favor of its healthfulness. The enterprise and vigorous advancement shown in the years of settlement contribute another promise to the logic whose conclusion is that Kansas is all that can be desired for health, and vigorous, pushing health at that.

Prof. Frank H. Snow, of the State University, at Lawrence, Kan., has kept a correct weather record since 1868. He publishes the tables of his observations in the large volume of the Report of the State Board of Agriculture. From them it appears that the mean temperature for the Spring months is 54 degrees, for Summer 76.39 degrees, for Autumn 52.89 degrees, and for winter 30.08 degrees; the mean temperature for the year is 53.34 degrees. This places Kansas in line with the States of Missouri, Southern Illinois, Southern Indiana, Southern Ohio, Kentucky, the Virginias, and Maryland.

The temperature of the western half of the State, a thousand and more feet higher than Lawrence (875 feet above sea level), is slightly lower, but no such accurate observations for a long period are at hand from that portion of the State.

The winters of Kansas are generally open; the fall of snow is comparatively light, rarely exceeding six inches in depth for a single storm. There is great variety in the cold of our winters. In 1869, 1874 and 1880, the temperature fell below zero only twice in each year. In 1872 the zero point was passed on sixteen days. In the winter of 1867-68 farmers were plowing during the whole of December, until the 5th of January, when winter began. Uninterrupted cold weather then lasted until the 12th of February, when the winter was at an end. The winter of 1871-72, on the other hand, extended from the 18th of November to the 15th of February.

The average number of days when the mercury reached ninety degrees at Lawrence, during the thirteen summers, was thirty-nine. But, though the thermometer indicates a higher temperature on a greater number of days than in Eastern States of the same latitude, the heat is, on the whole, much easier borne than there. First, the nights are invariably cool. Second, the air is in almost constant circulation—rarely becomes calm. Third, the most important modifier of heat is the dryness of Kansas atmosphere, which cools the body by rapid evaporation, and makes the high temperature of midsummer easy to endure. The greater the amount of moisture in the air, the more oppressive becomes the heat; so that eighty degrees in Philadelphia or Boston is far more intolerable than ninety degrees in Lawrence, or in Hays City.

The average date of the last light frost of spring is April 22d; that of the first light frost in autumn is September 25th, giving an average interval of 157 days entirely without frost. The period of freedom from *severe* frosts is considerably longer; averaging 200 days, from about the 4th of April to the 18th of October. The April frosts are seldom severe enough to materially injure fruit buds.

SOIL.

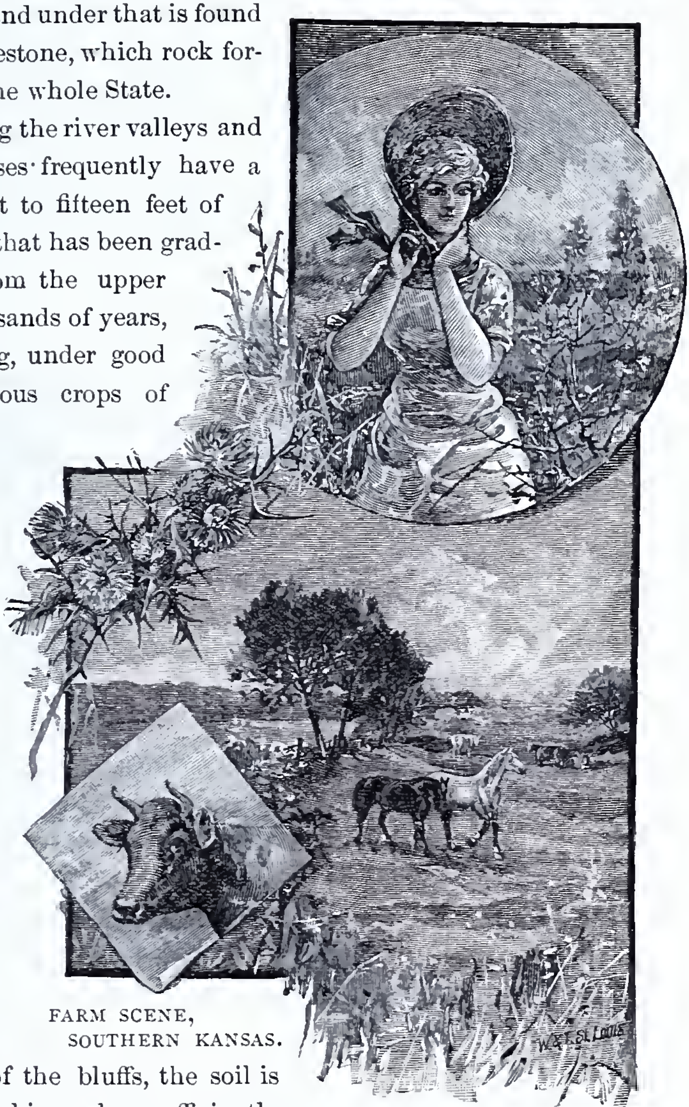
In nearly every portion of the State the soil is a dark, rich loam, composed of the accumulated mold of the vegetation of ages, mixed with fine, silicious grains of sand and lime. There is no "hard pan," except in a few counties on the Missouri border; there is no "gumbo," and consequently no "craw-fish" prairies. The surface soil is so porous that the heaviest rains are almost completely absorbed. "More rain, more rest," does not hold good in Kansas. The morning after a night's rain the farmer can plow or cultivate his corn field without fear of packing and baking the ground. The rain is stored in the soil, and is accessible to the roots of the crops during long weeks of cloudless, sunny weather. That is one of the secrets of the peculiar success of crop-raising in the State, and the intelligent farmer assists nature by plowing a little deeper every year and loosening the subsoil.

The ground is very easily plowed, as it turns nicely; the three-horse riding plow, cutting a sixteen-inch furrow, is coming into quite general use, and is doing quick, thorough work. So easily is the soil worked and planted that not a few shiftless people will scatter oats, for instance, in a corn-stubble field, and then run a harrow through it, expecting to raise a crop in such a sluggish manner, and frequently succeeding, too.

"The soil of both valley and high prairie is the same fine, black, rich loam so common in Western States. The predominating limestones, by this disintegration, aid in its fertility, but the extreme fineness of all the ingredients acts most effectively in producing its richness. * * * A few exceptions to this general rule exist in the extreme southwestern counties, but they contain only a small portion of the whole. * * * A very common opinion prevails, that the land lying near the Colorado line contains numerous alkali springs, and that the surface is sometimes covered with white alkali deposits. This is not so. During fifteen years' acquaintance with that portion of the State, I have seen but two springs appearing to contain that substance, and never found ten acres of land in one place, where the vegetation had been injured by it."—*Professor B. F. Mudge, State Geologist.*

The soil on the high, rolling prairies is several feet deep, resting frequently on gravel, and under that is found the magnesian limestone, which rock formation underlies the whole State.

The bottoms along the river valleys and in the creek courses frequently have a depth of from eight to fifteen feet of coal-black humus that has been gradually deposited from the upper lands through thousands of years, and now producing, under good cultivation, enormous crops of corn; from 50 to 90 bushels have been cribbed. And all this the splendid soil will do without manure, even without rational rotation of crops, though farmers who are wise enough to apply both, before the prodigious fertility of their farms show signs of exhaustion, reap an abundant reward.



FARM SCENE,
SOUTHERN KANSAS.

On mounds and on the declivities of the bluffs, the soil is thin, sometimes making, when sufficiently smooth and free from projecting stones, good "mowing lands," where the stock-raiser is cutting and putting up his hay; sometimes only fit for sheep pasture.

Fifteen per cent of the whole State is in bottom and valley lands as rich as the famous Connecticut, Mohawk, Genessee or Mississippi valleys, but in this genial climate, vastly more productive and healthy. Seventy-five per cent of the uplands is rolling prairie, susceptible in the eastern and central portions of easy and high cultivation, and in the north half of the western part, clothed in the thick carpet of buffalo grass. The other ten per cent is rough, broken bluffs, in the middle of the southeastern part even flinty pasture lands. On the whole, very little waste land, that would not bear at least some bunch grass for sheep pasture is found in the State.

There are no swamps, no natural lakes; artificial ponds are frequently made by the provident farmer for his cattle.

RAINFALL.

There has been a change for the better in this respect of late years, though it has probably not been caused by an increase in the rainfall.

The original wild grass which covered all the vast prairies of the West, the buffalo grass, forms a sward perfectly impervious to rain; water is shed by it as by a sheep pelt. Its presence always indicates a deep and strong soil. As it is plowed up, the soil is uncovered, and drinks in all the rain that falls upon it.

Formerly, the creeks and streams would rise rapidly and swell up to overflowing in a few hours after every shower. Now, they rise slowly, and fall as slowly, even after heavy rains. The buffalo grass is being crowded out, even on the unbroken pastures, by a long-stemmed variety, the "blue stem," equally good for grazing as for hay-making. We regard all these changes as sure indications that, with increased cultivation of the surface, more moisture becomes available.

The records of rainfall, kept at Fort Leavenworth (in longitude 94° 54′ west), in the Missouri valley, and on the extreme east line of Kansas, date from 1836. In periods of ten years the average rainfall observed was:—

From 1837 to 1846 (ten years)	30.4	inches.
" 1847 " 1856 " "	32.3	"
" 1857 " 1865 (nine years)	33.7	"
" 1867 " 1876 (ten years)	32.2	"
" 1877 " 1883 (seven years)	32.9	"

THE LEAST AMOUNTS FELL IN

1874	24.21 inches.	1882	22.07 inches.
1875	25.51 "		

THE LARGEST AMOUNTS FELL IN

1872	44.21 inches.	1870	41.70 inches
1877	44.01 "		

In 1888 it amounted to..41.84 inches.
In 1889 " " " ....32.49 "

About one hundred and forty miles west from the eastern State line (in longitude 96° 35′ and 1,300 feet above sea level) is Fort Riley, where similar observations have been made and recorded since 1853. In periods of ten years the average annual rainfall observed was:—

From 1854 to 1863 (ten years)	23.68 inches.
" 1864 " 1873 " "	24.22 "
" 1874 " 1883 " "	26.26 "
" 1884 " 1888 (five years)	22.09 "

This point is located so that it may be taken as a fair representative for all Central Kansas, nearly up to the 100th meridian, in Trego county.

THE LEAST AMOUNTS FELL IN

1854	16.93 inches.	1874	15.14 inches.
1860	15.36 "	1886	18.01 "

THE LARGEST AMOUNTS FELL IN

1876	37.38 inches.	1877	32.68 inches.
1879	38.06 "		

The annual average from 1854 to 1888 is 25.18 inches, of which April, May and June have 9.05 inches, and July and August, 7.19 inches. The winter months have from 0.50 to 1.95 inches.

CHURCHES.

As Kansas has been settled by an intelligent, an industrious, law-abiding people, from nearly every State in the Union, the means for public worship have been carefully cared for. It is always the best and the bravest of an Anglo-Saxon community who leave their homes, and follow an instinct which has made the race the most potent factor in the civilization of new countries and the subjugation of wild lands. As "God sifted three nations" to find material strong enough and brave enough in mind and body for the first settlements in America, so ever since that day the sifting process has been going on. As New England was settled by brave spirits from the elder world across the sea, so has Ohio, Indiana, Illinois and Kansas been settled by the stronger and more adventurous of the descendants of those men. "Freedom to worship God" was the keynote, the battle cry, the great overshadowing influence which nerved our fathers to their work on the "rock-bound shores" of New England. And, as the years have come and gone since then, until the epoch of the tenth generation of the Mayflower's emigrants has rolled around, we find that the influences which made that hazardous voyage possible in the seventeenth century were so strongly woven into the warp and woof of the human texture of the fathers, that their sons, in the tenth generation, are still moved and controlled by the same influences.

The commonwealths of Massachusetts and Connecticut were built upon a religious idea. In Ohio, Illinois, and, finally, in Kansas, we find that this enduring and ever present thought in the hearts of a freedom-loving people has blossomed into a flower which guarantees to all men who live beneath the protecting shields of the constitutions of those States, a larger, broader, more perfect religious liberty than the fathers dreamed of.

As soon as a new county was organized in Kansas, and the civil authority established, the people with one accord turned their attention to the organization of churches and schools. Wiser than their fathers, they separated church and State, and wiser still than this, they ordained that the State should not teach religion in the public schools, leaving that duty to the parents, and so securing absolute fairness in the expenditure of public moneys as between the adherents of different religious bodies. The wisdom of this action soon became apparent. Everywhere the school and the church flourished side by side; the one serving as the complement of the other.

Kansas has all, or nearly all of the religious denominations within her borders, as will be seen from the following alphabetical list, taken from the latest official report obtainable—the State publication for 1890.

African Methodist Episcopal, Baptist, Christian, Church of God, Congregational, Cumberland Presbyterian, English Lutheran, Episcopal, Free Methodist, Friends, German Baptist (Dunkard), German Lutheran, Hebrew, Methodist Episcopal, New Jerusalem Church, Presbyterian, Reformed Presbyterian, Roman Catholic, Seventh Day Adventist, Swedish Lutheran, Unitarian, United Brethern, United Presbyterian, Universalist and Wesleyan Methodist.

Here are twenty-five different denominations firmly entrenched in the State, owning property amounting in the aggregate to $8,801,870. There are 3,803 different church organizations owning 2,339 churches with a membership of 316,888. The larger denominations are as follows:

The Methodist Episcopal comes first with 1,201 organizations, 85,333 members, 698 churches and $3,108,295 worth of property.

The Baptists have 558 organizations, 32,698 members, 263 churches and $930,016 worth of property.

The Christians have 394 organizations, 25,143 members, 190 churches and $438,400 worth of property.

The Presbyterians have 373 organizations, 24,120 members, 272 churches and $1,826,400 worth of property.

The Congregationalists have 202 organizations, 12,053 members, 155 churches and $666,100 worth of property.

The Roman Catholics have 154 organizations, 87,454 members, 259 churches and $413,375 worth of property.

The number of churches in Kansas increased from 1,936 in 1888 to 2,339 in 1890, a gain of 383, or 16 per cent, and the value of church property increased from $6,415,937 in 1888 to $8,801,870, a gain of $2,385,933, or 37 per cent.

DENOMINATIONAL SCHOOLS.

Before treating of the public school system of the State, something more than a passing mention is due to the remarkable development of the denominational schools, fostered and supported by the churches. That so new a State as Kansas should have developed church schools to the extent shown by the following figures is certainly remarkable, and speaks eloquently of the esteem in which moral and intellectual culture is held by the people, who have given freely of their money, time and thought, that these schools might be established, where the religious tenets held by the parents could be transmitted to the children.

There are no less than thirty-five denominational schools in the State. These schools have an average yearly attendance of 6,317, and own property amounting to $2,147,000.

Denominational schools are very dear to the hearts of many parents, and it is presumed that the ability to send one's children to a church school would be an important factor in enabling the head of a family, who was looking about him with the idea of changing his residence, in deciding as to where he would locate. With this idea in view, the following information as to the location of denominational schools in Kansas is here given:

WHERE LOCATED.	NAME.	Average yearly attendance.	Value of buildings and other school property.
Atchison	Midland College (English Lutheran)	100	$ 50,000
Atchison	Trinity School (German Lutheran)	105	3,000
Atchison	College (Catholic)	150	....
Atchison	Academy (Catholic)	110	....
Concordia	Nazareth Academy (Catholic)	250	17,000
Clyde	St. Anne's Academy (Catholic)	50	8,000
Winfield	Southwest Kansas College (Methodist Episcopal)	160	80,000
Highland Station	Highland University (Presbyterian)	100	20,000
Baldwin	Baker University (Methodist Episcopal)	400	125,000
Hesper	Hesper Academy (Friends)	40	5,000
Lecompton	Lane University (United Brethren)	327	50,000
Dodge City	Dodge School of Theology (Methodist Episcopal)	30	....
Dodge City	College of Western Kansas (Presbyterian)	40	50,000
Ottawa	Ottawa University (Baptist)	260	140,000
Eureka	Southern Kas. Academy (Congregational)	137	13,000
Oswego	Oswego Female College (Presbyterian)	45	25,000
Leavenworth	Friends Academy (Friends)	95	5,000
Emporia	Emporia College (Presbyterian)	130	100,000
McPherson	McPherson College and Industrial Institute (German Baptist, Dunkard)	235	106,000
Beloit	Friends Academy (Friends)	32	3,000
Osage Mission	Osage Mission College (Catholic)	205	....
St. Mary's	College of St. Mary's (Catholic)	350	....
Sterling	Cooper's Memorial College (United Presbyterian)	100	25,000
Stockton	Stockton Academy (Congregational)	80	13,000
Salina	St. John's School (Episcopal)	....	60,000
Salina	Kansas Wesleyan University (M. E.)	174	50,000
Salina	Sacred Heart Parochial School (Catholic)	110	10,000
Wichita	Louis Academy (Presbyterian)	300	100,000
Wichita	Garfield University (Christian)	750	250,000
Topeka	Washburn College (Congregational)	300	350,000
Topeka	Bethany College (Episcopalian)	325	350,000
Topeka	Kas. Theological School (Episcopalian)	....	30,000
Washington	Washington Academy (Friends)	60	4,000
	Total	6,317	$2,147,000

THE PUBLIC SCHOOL SYSTEM.

Kansas is a State which has the right to boast of its public school system. The general government by a wise provision of law set aside the 16th and 36th section in each township for the benefit of the school fund. The fines collected from law breakers are in many instances placed to the credit of this fund. Whenever there are fifteen children between the ages of five and twenty-one years, a school district may be established, and thereafter the length of term in such district, if it has "a good and sufficient" school house, must be four months and may be twelve; the law making it the duty of the county superintendent, in conjunction with the county commissioners, to levy a tax sufficient to sustain the school for at least four months.

Ohio, Illinois, Pennsylvania and Massachusetts are States which claim to lead all the rest in intellectual and moral development. Well, then, what do these figures indicate?

Kansas has a school for every 185 in population.

Illinois has a school for every 300 in population.

Ohio has a school for every 300 in population.

Pennsylvania has a school for every 400 in population.

Massachusetts has a school for every 600 in population.

Kansas, has nearly twice the educational facilities for the masses that are enjoyed in the four great educational States of the union.

CITY SCHOOLS.

In the report of the Kansas State Board of Agriculture for 1890, may be found an exhaustive article on the Public Schools of Kansas. From this eminent authority the following information has been gleaned:

In Kansas there are three classes of cities: first, second and third; the cities of the first class have at least 15,000 inhabitants, and cities of the second class have at least 2,000 inhabitants. In cities of the first class the board of education has the power to elect a superintendent of schools, and to establish a high school. Every city of the first class and nearly every city of the second class has a superintendent and high schools. In a city of the second class the board of education consists of two members from each ward. Cities of the third class are subject to the laws governing county districts, and are, for school purposes, under the jurisdiction of the county superintendent.

GRADED COUNTRY SCHOOLS.

In nearly every county in the State a uniform course of study is followed, periodical examinations are held, and common-school diplomas are granted to pupils who finish with credit the prescribed course. The diploma granted by the county superintendent is usually taken at its face value in the high school at the county seat, and will always be honored in the county high school, when such a school has been established. In Dickinson county, for instance, the common-school diploma admits the holder into the county high school at Chapman, and the diploma granted to the pupil there, on finishing the course, admits him to the State University, State Normal School, or State Agricultural College. Thus from the first year of his school life, in the primary grade of the district school, the pupil has kept before him, as a constant incentive to study, the common-school diploma, graduation from the high school, and at last graduation from whichever of the higher colleges he may choose to enter.

TEACHERS' ASSOCIATIONS.

Meetings of Teachers' Associations are held annually in different parts of the State and are largely attended. The Association is not simply a tumultuous gathering without definite aim, for the work at each session is outlined with systematic wisdom. The college and high school section has its separate meeting to discuss questions relating solely to secondary and higher education; likewise, the common and graded section meets to consider subjects pertaining exclusively to the common schools. Each morning or afternoon, as may be determined, there is a union meeting composed of all the sections. The resolutions of the Association always receive respectful treatment from the Legislature, and it can be said that, as a general rule, changes not approved by the teachers of the State, as represented in the State Association, are seldom made.

THE INSTITUTE LAW.

In 1877, the State Legislature, guided by eminent teachers, enacted the institute law. It is a notable fact that nearly every school law on the Kansas statute book was placed there on the prompting or leading of some teacher.

It is provided in this law, that every county superintendent shall hold annually in his county, for a term of not less than four weeks, a Normal Institute for the instruction of teachers, and those desiring to teach. It is provided that in sparsely settled portions of the State, two or more counties may unite in holding one Normal Institute. Yet such is the spirit of superintendents and teachers, that this privilege is seldom exercised. In 1890, each county in Kansas had its own Normal Institute. The revenue for the support of the institute is derived from fees paid by applicants for teachers' certificates, and from fees paid by students at the institute. The examination fee is one dollar; the institute registration fee, one dollar. Thus it will be seen that the total cost of tuition to each student for four weeks' instruction is at the most but two, and if the student has a two or three years' certificate, the cost is but one dollar. Board is, of course, not considered in this estimate. There is no expense for books. The State grants annually to every institute in which fifty or more students are enrolled, fifty dollars, and the county commissioners may pay into the Normal Institute fund of the county a sum not to exceed one hundred dollars. The county superintendent manages the institute, and employs the conductors and such additional instructors as may be needed. These selections must be approved by the State Superintendent. A course of study prepared by the State Board of Education is required to be followed in every institute. The course is now graded, and it is expected that the Legislature will soon amend the law so that long-time certificates can be granted to teachers who finish the course, and have had experience in teaching. Instruction in normal institutes is given in orthography, reading, penmanship, grammar, arithmetic, United States history, physiology, constitution of the United States, natural philosophy, book-keeping, drawing, botany, mental philosophy, methods of instruction, school organization and management and calisthenics. The study of didactics, school management and organization is made prominent, and in all the classes the instructors are expected to make the acquisition of facts incidental to the important work of a training in methods, and in mental science as related to teaching. These normal institutes have done a vast deal of good during the fourteen years which have passed since the law was adopted.

TEACHERS' CERTIFICATES.

The State Board of Education is composed of the State Superintendent of Public Instruction, the Chancellor of the State University, the President of the State Normal School, and the President of the State Agricultural College. This Board holds an examination for State certificates once a year, in the month of August. For the convenience of candidates the examination is held at each of four or five central points. For instance, in 1890 examinations were held at Topeka, Lawrence, Manhattan, Emporia, Norton and Dodge City. State certificates are issued to candidates who pass the required examination and who have taught school for one year.

A State diploma is issued to successful candidates who have taught for five years, two of which must have been in the State of Kansas. Students who complete the course at the State Normal School are granted a life diploma, which authorizes the holder to teach in any part of the State. A one-year State certificate is also granted to students who complete the first two years' work.

COUNTY CERTIFICATES.

In every county there are held four examinations each year—one on the last Saturday in January, in April, in October, and at the close of the annual Normal Institute. The questions are prepared by the State Board of Education, and are sent to the County Superintendent of each county a few days before the examination. The questions are in a sealed package, which must not be opened until the hour for beginning the examination has arrived. The county examining Board consists of the County Superintendent and two associates, each of whom must hold a first-grade county certificate, and each of whom is appointed by the County Commissioners, on the nomination of the County Superintendent. County certificates are of three grades—first, second and third. Certificates of the first grade are issued to persons who make a general average of 90 per cent in the following named studies: Orthography, reading, writing, English grammar, composition, geography, arithmetic, United States history, constitution of the United States, book-keeping, physiology and hygiene, the theory and practice of teaching, the elements of natural philosophy. Seventy is the lowest percentage allowed in any branch for the grade. The applicant must be at least eighteen years of age, and must have taught, successfully, twelve school months.

The second-grade certificate is granted to persons who average 80 per cent in all the branches prescribed for first-grade certificates, except book-keeping and natural philosophy. The applicants for second-grade certificates must not fall below 60 per cent in any one branch. Persons who receive this grade must be not less than seventeen years of age, and must have taught successfully at least three months. The qualifications for certificates of the third grade may be prescribed by the County Examining Board, though the custom throughout the State is to require applicants for that grade to be examined in all the branches required for the first grade except book-keeping, natural philosophy and constitution of the United States. The average generally required is 70 per cent.

The first-grade certificate continues in force three years, the second two years, the third one year. The first-grade county certificate has, to a limited extent, the value of a State certificate, for, on the endorsement of the County Superintendent, an unexpired first grade can be made valid in any county in the State.

TEMPORARY CERTIFICATES.

The County Superintendent is authorized to issue temporary certificates, valid only until the next regular examination, and in the school district designated in the certificate. The certificate can be issued only on the request of the District Board of the district in which the certificate is to be used. Under the old system, and it is that which is still in force in nearly every other State, each County Board made its own questions and fixed its own standard. Hence it is not surprising that there were varying standards, which made life somewhat burdensome to the teacher who, in the pursuit of his calling, moved from county to county.

The diploma issued by the State Normal School authorizes the holder to teach in the schools of any district or city in the State. Detailed information concerning the diploma can be found in the section relating to the Normal School.

HIGH SCHOOLS.

Nearly every city in the State has an excellent high school, usually furnished with all needed apparatus and a well-selected library. But until 1886 the State had made no provision for high schools outside of incorporated cities. The county high school act passed in 1886 provides that, for the purpose of affording better educational facilities for pupils more advanced than those attending district schools, and for persons who desire to fit themselves for teaching, in each county having a population of six thousand or more, a county high school may be established by a vote of the people. A county high school election is called by the County Commissioners on the petition of one-third the legal voters in the county. If the majority vote in favor of the school, the County Commissioners appoint six persons who, with the County Superintendent, shall constitute a board of trustees for the school. The appointments hold only until the next general election, and provision is made that two trustees shall be elected every year. It is provided that in no case shall the total tax for building, teachers' wages, and incidental expenses exceed six mills on the dollar, and for teachers' wages and incidental expenses alone, the tax must not exceed three mills on the dollar. The law requires that there shall be three courses of instruction—a general course, a normal course, and a collegiate course—each requiring three years' study. Tuition is free to all pupils residing in the county in which the school is situated. No person shall be admitted to the county high school who has not passed a satisfactory examination in all the branches required to be taught in district schools. Non-resident pupils may be admitted on the payment of tuition fees. Those graduating from the normal course shall be entitled to a teacher's second-grade certificate and are admitted to the first year of professional work at the State Normal School without further examination. And those graduating from the collegiate course are admitted to the Freshman class of the State University and of the State Agricultural College without further examination.

The county high school act has been in force about four years, and already two counties have availed themselves of its liberal provisions. In Chapman, Dickinson county, there is one of the best high schools in the State. The building itself is a beautiful structure, and liberal provision has been made for the work to be done within its walls. The school was opened in 1888. It was asserted by many that the school would be simply local in its character, and that no pupils could be expected from remote parts of the county. But the register for this and last year shows that every township in the county is well represented, and there are a number of students from places fifteen to twenty miles distant from Chapman. The enrollment the first year was 137. The people of Dickinson county, without regard to location or to party, have taken a great interest in the school, and those who are remote from Chapman have been as cordial in their support as those living in the immediate neighborhood. The school itself is educating the people, for it is a perpetual stimulus to all the pupils in the district schools to press forward to graduation. In the county high school we have found the link which connects the country district schools with our higher institutions of learning. The professors at this school are graduates of the University of Kansas, the Illinois Normal School, the Kansas Normal College, Iowa College, and other recognized seats of learning.

In the foregoing condensed view of the Kansas public school system, the reader will see what ample educational facilities have been placed within the easy reach of every child in the State, poor and rich. Perfection in the machinery is not claimed, but advancement is discernible in every section of the school laws. The people of Kansas are constantly pressing forward to higher ground, and inequalities and imperfections of all sorts will gradually but surely disappear.

The following resume of statistical tables relating to common schools for the year 1890, tell in the most concise form, what the people of Kansas are doing to educate the children of the commonwealth:

The statistical tables for 1890 give these totals: At the Normal Institutes, *in all counties*, the total number of days in session was 2,000. The average daily attendance was 8,796. The enrollment was 11,748.

The number of organized school districts in the State was 9,022.
The number of district clerks reporting was 8,713.
Number of male teachers, 4,173.
Number of female teachers, 6,208.

School population between the ages of 5 and 21 years:

Males	260,651
Females	248,963
Total	509,614

Average length of the school year in weeks, 27.

RECEIPTS AND DISBURSEMENTS.

RECEIPTS.—

From County Treasurers from district taxes	$3,572,340 20
From State and county funds, apportioned to districts	502,502 95
Total amount received during the year from all sources for school purposes	5,696,659 96

DISBURSEMENTS.—

For teachers' wages and supervision	$3,021,066 38
For rent, repairs, fuel and incidentals	680,291 16
Total disbursements during year for school purposes	4,972,966 86

The value of school property in Kansas increased from $8,602,202 in 1888 to $10,617,149 in 1890, a gain of $2,008,202, or 23.5 per cent.

HIGHER EDUCATION.

The school system outlined by the pioneers in the State Constitution was complete from turret to foundation stone, from the prairie school house to the university. Section 2, of the Constitution, reads as follows: "The Legislature shall encourage the promotion of moral, scientific and agricultural improvement, by establishing a uniform system of common schools and schools of higher grade, embracing normal, preparatory, collegiate and university departments." Carrying out the spirit and letter of this section, the Kansas people have established three great schools.

The University of Kansas, situated at Lawrence.

The State Normal School, at Emporia.

The State Agricultural College, at Manhattan.

THE UNIVERSITY OF KANSAS.

In the act admitting Kansas into the Union, it is provided that seventy-two sections of land shall be set apart and reserved for the use and support of a State University, to be selected by the Governor of said State, subject to the approval of the general land office, and to be appropriated and applied in such manner as the Legislature of said State may prescribe for the purpose aforesaid, but for no other purpose. The University buildings occupy the summit of Mt. Oread, concerning which the words of the Psalmist could be fittingly used, "Mount Zion stands most beautiful, the joy of all the land." From the doors of the main building can be obtained one of the loveliest and most significant views in the land. For there, spread out before one, are hill and dale, fields and orchards, streams and woods, church spires and school house turrets. In brief, all the evidences of a Christian civilization, and all wrested from the wildness of nature and the savagery of man during the last thirty-five years.

The following description of the buildings is taken from the last annual catalogue:

The east wing of the main floor, which is fourteen feet to the eaves, is occupied as a lecture room, seated in amphitheater style, and capable of accommodating one hundred students. In addition to the usual ventilating apparatus, the plan includes flues in the wall, connected with hoods, and hoods in the center of the main laboratory, which are ventilated by glazed pipes, terminating above the roof.

All the rooms are heated by steam, and are supplied with gas and water. The laboratory intended for students in qualitative analysis has over 25,000 cubic feet of air space, and will accommodate fifty-four students, each supplied with cupboards, set of re-agent bottles, and other necessary apparatus.

Snow Hall of Natural History.—Snow Hall, located about 200 feet west of the center of the main building, is 110 feet in length by 100 feet wide; is provided with ample basement almost entirely above ground; two stories of 16 and 16 feet respectively, and an attic of 12 feet. Its museums are designed to make a complete exhibit of the various cabinets in Zoölogy, Geology and Botany, and its laboratories are so related to the various cabinets as to secure the utmost convenience. The lecture room, extending through the basement and first story, and arranged in amphitheater style, will accommodate 200 students. This building, finished and furnished with the best appliances for investigation and instruction in all branches of Natural History, adds materially to the educational advantages offered by the University.

The following are the names of the instructors:

Francis Huntington Snow, Ph. D., LL. D., President, Professor of Botany, Entomology and Meteorology, and Director of the Museum of Natural History.

David Hamilton Robinson, Ph.D., Professor of Latin Language and Literature, and Secretary of the Faculty.

Ephraim Miller, A. M., Professor of Mathematics and Astronomy.

James Wood Green, A. M., Dean of School of Law; and Professor of Constitutional Law, Evidence, Equity, Jurisprudence and Criminal Law.

William Herbert Carruth, A. M., Professor of German Language and Literature.

Frank Olin Marvin, A. M., Professor of Civil Engineering.

Edgar Henry Summerfield Bailey, Ph. D., Professor of Chemistry, Mineralogy and Metallurgy.

James Willis Gleed, A. M., Professor of Law of Real Property, Torts and Domestic Relations.

Alexander Martin Wilcox, Ph. D., Professor of Greek Language and Literature.

Lucius Elmer Sayre, Ph. G., Professor of Pharmacy.

Arthur Graves Canfield, A. M., Professor of French Language and Literature.

Lucien Ira Blake, Ph. D., Professor of Physics and Astronomy.

Anna March Dunlap, Professor of Piano and Voice.

Lewis Lindsay Dyche, A. M., M. S., Professor of Zoölogy, Anatomy and Physiology; Taxidermist, and Curator of Mammals and Birds.

Frank Wilson Blackmar, Ph. D., Professor of History and Sociology.

Charles Graham Dunlap, A. B., Professor of English Language and Literature.

George Barlow Penny, B. S., Dean of School of Music; and Professor of Piano, Voice, Harmony and Theory.

Samuel Wendell Williston, M. D., Ph. D., Professor of Geology and Paleontology.

Olin Templin, A. M., M. S., Associate Professor of Philosophy.

George Edward Hopkins, Professor of Drawing and Painting.

Frank Heywood Hodder, Ph. M., Associate Professor American History and Civics.

Miles Wilson Sterling, A. B., Assistant in Greek.

Edward Charles Murphy, M. S., C. E., Assistant in Civil Engineering.

Edward Curtis Franklin, B. S., Assistant in Chemistry.

William Chase Stevens, B. S., Assistant in Botany.

E. Putnam West, Assistant in Geological Museum.

Frank E. Ward, Assistant in Electrical Engineering Shops.

Edwin Mortimer Hopkins, A. M., Assistant in English.

Gertrude Anna Crotty, B. S., Assistant in Anatomy and Physiology.

Vernon Lyman Kellogg, B. S., Assistant in Entymology and Chancellor's Secretary.

Hannah Oliver, A. M., Assistant in Latin.

Francis Schlegel Carruth, Assistant in German and French.

Henry Byron Newson, Ph. D., Assistant in Mathematics.

Samuel Robert Boyce, Ph. C., Assistant in Pharmacy.

Alfred Goldsborough Mayer, M. E., Assistant in Physics and Electrical Engineering.

William Baldwin Brownell, A. B., Assistant in Law.

Ephraim Douglass Adams, Ph. D., Assistant in History and Sociology.

Robert Irving Fulton, A. M., Assistant in Elocution and Oratory.

Solon Otis Thacher, LL. D., Lecturer on Equity.

Alfred Washburn Benson, Lecturer on Pleading and Practice.

Samuel Agnew Riggs, A. M., Lecturer on Torts and Law of Railways.

Arthur Osborne Ridgeway, Instructor in Mechanical Drawing.

Martin Everitt Rice, B. S., Instructor in Physics Laboratory.

Carrie M. Watson, A. B., Librarian.

The following table speaks for itself:

BOARD OF INSTRUCTION.

Names.	Where Born.	Where Educated.
F. H. Snow	Massachusetts	Williams and Andover Seminary.
D. H. Robinson	New York	Rochester.
E. Miller	Ohio	Allegheny.
J. W. Green	New York	Williams.
W. H. Carruth	Kansas	University of Kansas and Harvard.
F. O. Marvin	New York	Allegheny.
E. H. S. Bailey	Connecticut	Illinois Wesleyan and Yale.
J. W. Gleed	Vermont	University of Kansas.
A. M. Wilcox	Baltimore	Yale.
L. E. Sayre	New Jersey	Philadelphia.
A. G. Canfield	Vermont	Williams, Berlin and Paris.
L. I. Blake	Massachusetts	Amherst and Berlin.
Anna March	Ohio	Cincinnati.
L. L. Dyche	Kansas	University of Kansas.
F. W. Blackmar	Pennsylvania	Johns Hopkins.
C. G. Dunlap	Ohio	Ohio Wesleyan and Johns Hopkins.
G. B. Penny	New York	Cornell.
S. W. Williston	Illinois	Kansas Agricultural College and Yale.
O. Templin	Indiana	University of Kansas and Berlin.
M. W. Sterling	West Virginia	University of Kansas and Johns Kopkins.
C. E. Murphy	Canada	Cornell.
C. E. Franklin	Kansas	University of Kansas.
W. C. Stevens	Illinois	University of Kansas and Harvard.

E. P. West	Kentucky	Kentucky.
F. E. Ward	Illinois	Illinois.
E. M. Hopkins	New York	Princeton.
G. A. Crotty	Colorado	University of Kansas and **Harvard.**
V. L. Kellogg	Kansas	University of Kansas.
Hannah Oliver	England	University of Kansas.
F. S. Carruth	Massachusetts	Boston.
H. B. Newson	Ohio	Ohio Wesleyan and Leipsic.
S. R. Boyce	Michigan	Ann Arbor.
A. G. Mayer	Virginia	Stevens Institute.
Cora Parker	Kentucky	Kentucky.
W. B. Brownell		University of Kansas.
E. D. Adams		University of Michigan.
R. I. Fulton		Ohio Wesleyan.
S. O. Thacher		Union.
S. A. Riggs		Washington and Jefferson.
M. E. Rice		University of Kansas.
C. M. Watson		University of Kansas.

In 1890–91, less than a quarter of a century after the founding of the University, the faculty numbers forty-nine; the students, 474. Several years ago the preparatory department was closed and now no student not possessing a city or county high school diploma, or its equivalent, is admitted.

Nearly seventy high schools in Kansas prepare students for any one of the six regular courses.

The University of Kansas draws its students from all parts of the State, more especially from the homes of farmers, mechanics, and laborers, as the following table, giving the occupations of the parents of the students, conclusively shows:

Farmers (including stock-raisers, dairymen, horticulturists, etc.)	38 per cent.
Bankers and capitalists (including manufacturers, etc.)	5 per cent.
Professional men (including doctors, ministers, lawyers, teachers, editors, civil and mining engineers, artists, dentists, etc.)	21 per cent.
Merchants and tradesmen (including druggists, millers, real estate men, grocers, dry goods men, harness men, etc.)	19 per cent.
Artisans (including carpenters, laborers, blacksmiths, contractors, jewelers, mechanics, quarrymen, saddlers, etc.)	5 per cent.
Miscellaneous (including railroad agents, commercial travelers, hack-drivers, insurance agents, hotel and boarding house keepers, revenue agents, clerks, abstractors, railroad foremen, county officials, etc.)	12 per cent.
	100 per cent.

For an institution having such a brief history, the University of Kansas is rich in the aids and appliances without which proper instruction is impossible. In the library there are 14,000 volumes, valued at $30,000; the natural history collections comprise 150,000 specimens, valued at $100,000.

In the departments of the sciences, the literatures, and the arts, there are five courses—the general scientific, Latin scientific, classical, modern literature, Latin, English and general language.

Persons who desire to enter the University to follow special studies, have the privilege to do so.

For students who desire a technical training, there is provided a course in civil engineering and in electrical engineering. In the law department, thorough instruction is given in all the principles of law known in our State or Federal courts. Graduates from this department are admitted to practice in all Kansas courts.

In the Seminary of Historical and Political Science, a branch of the department of American history and civics and that of history and sociology, students are instructed in American history and civics, constitutional law, international law and diplomacy, political economy, elements of sociology, and students who wish to become journalists are given lectures on journalism, and opportunities to report, edit, "make up," and do all the other work usually done on a first-class newspaper.

Other departments of the University are the school of music, school of art, and school of pharmacy. A preparatory medical course has been lately prepared. Limited space makes it impossible to note in detail the work of the University. Enough has been said to show that the young men and young women of Kansas have been given, at small cost by the State, the finest facilities for acquiring a liberal education.

STATE NORMAL SCHOOL AT EMPORIA.

There is but one State Normal School in Kansas, but that has been sustained so liberally, and is so convenient of access, that it attracts to itself students from all parts of Kansas. Beginning on the 15th of February, 1865, with 18 pupils, it has now on its rolls more than 1,200 students, a greater enrollment than can be found in any other State Normal School in the United States. During the year ending July 12th, 1890, 908 were enrolled in the Normal department, and 212 in the Model school. More than 400 of the students held teachers' certificates on entering, 75 first-grade and 200 second-grade certificates. The class of 1890 numbered 53 averaging in age 23 years, and more than two years' experience in teaching. Eighty-two of the 106 counties in Kansas are represented in the school, and there are students from thirteen other States and from two territories.

The occupations of the parents of the pupils in the Normal department are shown in the following list:

Blacksmiths	7
Carpenters	10
Contractors	8
Clerks	4
Doctors	13
Engineers	3
Farmers	454
Furniture dealers	3
Hotel-keepers	3
Housekeeping	10
Lawyers	21
Lumber dealers	4
Mechanics	4
Merchants	25
Millers	3
Ministers	10
Real estate dealers	17
Stock dealers	6
Teachers	9
Traveling salesmen	5
Miscellaneous	57

The total number of parents who reported was 674.

To all students living outside a radius of 100 miles from Emporia, all necessary railroad fare paid beyond that limit is refunded.

This, it is believed, is the only school in the country which has reduced the traveling expenses of pupils.

The Normal School, like the other two State schools, is under the management of a Board composed of six regents.

The following are the names and titles of the members of the faculty:

Albert R. Taylor, Ph. D., Lincoln University, President, Mental, Moral and Social Sciences.

Jasper N. Wilkinson, Illinois Normal University, Secretary, Director in Training.

Thomas H. Dinsmore, Jr., Ph. D., Highland and Johns Hopkins, Physics and Chemistry.

Middlesex A. Bailey, A. M., Wesleyan University, Conn., Mathematics

Dorman S. Kelly, Indiana State Normal School, Natural History.

Joseph H. Hill, A. M., Kansas State Normal and Northwestern University, Latin.

Emma L. Gridley, State Normal School, Drawing and Geography.

M'Louise Jones, A. M., Michigan University, Grammar and Rhetoric.

Cora Marsland, O. B., Emerson School of Oratory, Elocution and Literature.

L. Aloys Bidez, LL. D., University of Brussels, Vocal Music, Piano and Theory.

Emilie Kuhlmann, Bremen, Model Primary and Kindergarten.

Achsah M. Harris, Kansas State Normal School, Assistant, Model Intermediate.

Mary A Whitney, Kansas State Normal School, Librarian and U. S. History.

William C. Stevenson, Kansas State Normal School, Penmanship and Book-keeping.

Eva McNally, Kansas State Normal School, Assistant Teacher, English.

Eli Payne, Assistant Teacher, Matbematics, State Normal School.

Frances S. Hays, Assistant, Model School.

Eva E. Bidez, Assistant Teacher, Violin, Mandolin and Vocal Music.

Alonzo M. Collette, Taxidermist.

L. W. Baxter, Clerk and Book-keeper.

STATE AGRICULTURAL COLLEGE AT MANHATTAN.

On July 2d, 1862, Congress passed an act granting to each State public lands to the amount of 30,000 acres, for each of the Senators and Representatives in Congress, according to the census of 1860, for the "endowment, support and maintenance of at least one college, where the leading object shall be, without excluding other scientific and classical studies, and including military tactics, to teach such branches of learning as are related to agriculture and the mechanic arts, . . . in order to promote the liberal and practical education of the industrial classes in the several pursuits and professions of life." The fund arising from the sale of the lands thus acquired amounted to $501,426.33, and the interest on this amount forms the main income of the college.

The college receives from the United States Government each year $15,000 for the maintenance of an experiment station; this, in the language of the act making the appropriation, is "to aid in acquiring and diffusing among the people of the United States useful and practical information on subjects connected with agriculture, and to promote scientific investigation and experiment respecting the principles and applications of agricultural science."

In 1890 an act was passed by Congress, providing that each State should receive for the benefit of its agricultural colleges $15,000 for the year ending June 30th, 1890, the amount to be increased by $1,000 for ten years, at the expiration of which time the amount will be $25,000 per annum. The first payment, under the provisions of the act, was to become due when the Legislature of the State, if in session, accepted the conditions; if the Legislature was not in session, the Governor had the power of acceptance. Governor Humphrey, for the State, immediately accepted the grant, and the first payment, $15,000, was promptly made by the Government. Next year the payment will be $16,000. In the year 1900 the annual amount, as fixed by the act, will have reached $25,000.

The total annual income of the college at present for college and experimental purposes is $65,000. The State makes appropriations for building and other permanent improvements. The government is vested in a board of Regents, seven in number.

The college was established in 1863 on a site about two miles from Manhattan. In 1873, the present site, about one mile from the city, was selected. From the buildings and grounds there can be obtained a magnificent view of the Kansas Valley, one of the most fertile valleys in the world.

Graduates of the country schools can pass directly into the college without examination.

The figures in the following table show how the college has prospered during the ten years ending June 30, 1890:

	1880.	1890.
Members of faculty	12	18
Assistants	0	11
Student assistants	1	5
Students	276	515
Post-graduates	2	11
Graduates	7	27
Total graduates	56	232
Age of students, years	18.86	19.93
Productive endowment	$220,329 36	$495,316 07
Value of buildings and grounds	60,345 00	159,275 00
Value of apparatus, etc	25,664 76	96,974 95
Total inventory College and Station	86,008 76	266,749 95
Annual income	19,320 49	55,805 45
Library, bound volumes	2,500	10,000

The following list gives the names and titles of all the professors and other instructors in the College:

George T. Fairchild, A. M., President, Professor of Logic and Political Economy, Secretary of Board, and Chairman of Station Council.

George H. Failyer, M. Sc., Professor of Chemistry and Mineralogy, and Station Chemist.

Edwin A. Popenoe, A. M., Professor of Horticulture and Entomology, Superintendent of Orchards and Gardens, and Station Horticulturist.

David E. Lantz, M. Sc. Professor of Mathematics, Librarian.

John D. Walters, M. Sc., Professor of Industrial Art and Designing.

Ira D. Graham, B. Sc., Secretary, Instructor in Book-keeping, and Assistant Secretary of Board.

Oscar E. Olin, Professor of English Language and Literature.

Mrs. Nellie S. Kedzie, M. Sc., Professor of Household Economy and Hygiene.

Mrs. Elida E. Winchip, Superintendent of Sewing.

Ozni P. Hood, B. Sc., Professor of Mechanics and Engineering, and Superintendent of Workshops.

Alexander B. Brown, A. M., Professor of Music.

John S. C. Thompson, Superintendent of Printing.

Francis H. White, A. M., Professor of History and Constitutional Law.

Charles C. Georgeson, M. Sc., Professor of Agriculture, Superintendent of Farm, and Station Agriculturist.

E. B. Bolton, Captain 23d U. S. Infantry, Professor of Military Science and Tactics.

Ernest R. Nichols, A. M., Instructor in Physics, Superintendent of Telegraphy.

Nelson S. Mayo, M. Sc., D. V. S., Instructor in Physiology and Veterinary Science, Station Veterinarian.

Julius T. Willard, M. Sc., Assistant Professor of Chemistry.

James W. Rain, Instructor in English.

Albert S. Hitchcock, M. Sc., Professor of Botany.

ASSISTANTS AND FOREMEN.

J. T. Willard, M. Sc., Assistant in Chemistry.

C. M. Breese, M. Sc., Assistant in Chemistry.

Jennie C. Tunnell, B. Sc., Assistant Librarian.

S. C. Mason, B. Sc., Assistant in Horticulture, and Foreman of Gardens.

F. A. Marlatt, B. Sc., Assistant in Entomology.
H. M. Cottrell, M. Sc., Assistant in Agriculture.
Wm. Shelton, Foreman of Farm.
C. A. Gundaker, Foreman of Blacksmith Shop.
W. L. House, Foreman of Carpenter Shop.
A. C. McCreary, Janitor.
W. T. Swingle, Assistant in Botany.

NEWSPAPERS.

About nine hundred newspapers and periodicals are published in Kansas. The State contains a population which may be truthfully set down as a reading people. In the early days a high standard of journalistic excellence was set up, and this quality still remains in the State press.

POPULATION AND WEALTH.

Not until after the war of the rebellion was the development of the West thought of. The western border of civilization had been at the Missouri river, but the Pacific railways completed, opening up communication with the Southwest, caused the thousands of young men in the over-crowded East, and the volunteer soldiers mustered out from service to seek new fields. Kansas had been the pivotal point in the strife, and was the natural haven of the soldier and his younger friends coming to maturity, and besides almost every quarter section of land in the State had been placed within easy access of the railways. The growth of Kansas was phenomenal. In 1860 the population of Kansas was 107,000, nearly half of whom were driven from the State by threatened famine or joined the Union forces then mustering. In 1870 over 250,000 had been added to the rolls, while ten years later a million souls had made Kansas their home, and since that time the number has again nearly doubled. In 1871 there were under cultivation but 93,000,000 acres in the whole of the United States. In 1885 the acreage had increased to 197,000,000, thus in fourteen years more than doubling the entire area placed under cultivation from the discovery of America until 1871. Kansas' quota in 1871 was 551,000 acres; in 1885 Kansas planted ten times that area in corn alone, four times that acreage in winter wheat, twice that in both oats and rye, as much to each in tame grasses, barley and millet, half that to flax, and cut hay from eight times that area of prairie grass under fence.

The population of Kansas in 1888, as returned by the assessors of the State, was 1,518,552. In 1890 the population, as returned by the National census, was 1,427,096, showing a loss during two years of 91,456, or about six per cent. In commenting on these figures, the State Board of Agriculture says, in its Seventh Biennial report:

"That the State should sustain such a loss in population, and yet, during the same time, increase in productive wealth, and show progress in nearly every interest or industry of the State, may be surprising, yet it is true. Statistics officially furnished this office show the progress made by the State during the biennial period covered by this report.

"The total number of acres devoted to field crops in the year 1888 was 13,945,772. In the year 1890 it was 15,929,654; a gain in two years of 1,983,882 acres, or 14.22 per cent."

These figures from the Seventh Biennial report are, in themselves, sufficiently suggestive, but when we add to them the figures furnished by the same Board, in their annual report for the year ending December 31, 1891, which has just appeared, the argument showing the actual advance of Kansas in material prosperity, notwithstanding the apparent loss in population, becomes irresistible.

In 1891 the total number of acres devoted to field crops was

17,518,018,

a gain in one year of 1,588,364 acres or within a fraction of ten per cent.

In 1888 the acreage in field crops was 13,945,772.

In 1890 the acreage in field crops was 15,929,654.

In 1891 the acreage in field crops was 17,518,018.

Keeping these figures in mind, read what the State officials had to say in regard to the falling off in population in 1890, with only the crop and acreage returns for that year before them:

"The above statistics seem to indicate that, while there has been a falling off in population, that portion of our people which creates wealth has sustained no loss. For, as stated above, we see there has been an increase in area in field crops * * * of 14.22 per cent, also, we see that the combined value of farm products for the years 1889–90, exceeds the combined value of farm products for 1887 and 1888 by $8,179,351, or about three per cent * * *."

(And we are now able to add, in further support of the argument, that the yield for 1891 exceeded the yield for 1890 by about $15,000,000.)

"A careful analysis of the population of our State reveals to us the reason why this is so. In sixteen cities and towns of the eastern half of Kansas there has been a loss of 45,643 in population, or half of the entire loss of the State. This surplus population, which added nothing to the permanent wealth of the State, came here on a tidal wave. They were boomers and speculators, and mechanics and laborers' who always follow in the wake of a boom. * * * In 1887 the balloon was punctured; the gas escaped, but the effect of the collapse was not fully realized until after March 1st, 1888, at which time the assessor's returns show that the climax of city population was reached. * * * The city population, which, after the collapse, were obliged to leave, were largely non-producers. * * * The speculators in Western Kansas were also non-producers. * * * We therefore see that the productive force, or the agricultural wealth-producing portion of the State remains, and that the State, in an agricultural way, makes a good showing."

THE CLAIM HOLDER.

One other fact should be mentioned, which, taken in connection with the above, effectually disposes of the assertion that anything like a permanent decrease in the desirable population of Kansas exists.

During the hegira to the West—1884–87—there developed a species of *genus homo* known as the claim holder. Unlike the bounty jumper, both sexes were represented. As an "easy job" for the summer, the claim holder would leave the desk or counter, the school-room or the farm, the work-bench or the anvil, the wash-tub or the doctor's care, and repair to Western Kansas, locate a claim, "hold it down" for six months, while they breathed the fresh air, wrote glowing letters to their friends, and awaited the end of the six months, when they might "prove up" their claim and mortgage it! Well, the "claim holding" industry no longer thrives in Kansas.

CANCELING MORTGAGES

The records of Kansas show a decrease of farm mortgages of over $16,000,000 in the last fifteen months. It is safe to say that the farm mortgage indebtedness of Kansas is being paid off at a rate of over one million dollars a month. As the total amount at present will probably not much exceed $50,000,000, it is not improbable that the farmers of the State will be substantially free from debt in four years.

Owing to the high prices of farm products, and favorable indications of an enormous crop in 1892, many a Kansas farm will pay for itself this year.

CORN FIELD, KANSAS.

PRODUCTS.

The staple crop of Eastern Kansas is corn ; tame hay, fruit and potatoes give especially large yields, and breeding of high grade and thoroughbred live stock is one of the chief industries. Wheat is the staple of Central Kansas, although corn and mixed crops, stock-raising and fruit-growing are fast becoming quite as important, especially in the eastern portion of the belt. Western Kansas is but scantily developed into an agricultural region, and it is not yet clearly demonstrated that success will attend outside irrigation. The wondrously rich soil gives a double portion when the seasons favor. A number of irrigation canals have been taken from the Arkansas river, and others are being constructed leading from the Solomon. When irrigation is applied the products are far superior and the yield far in excess of farms in other portions of the State. The western portion of Kansas is best adapted to the stock-grower, as his cattle will thrive pasturing on the nutritious buffalo grass during the open winter, provision being made necessary only for the more stormy weather, when shelter is as needful as forage. Fodder, such as sorghum, wild maize and millet, are successfully grown, giving good yields without irrigation, while winter wheat, sown early in the fall, affords excellent pasturage, serving as a condiment to the drier feed, and not harmed by the winter cropping, but, in favorable years, gives good yields of grain and straw, while the pasturing pays for seed and planting in any event.

CORN.

Only about one-fourth of the area of Kansas is under cultivation. In the central and eastern portions of the State the uncultivated land, which now awaits the quickening hand of labor, is as productive as that now in use.

Corn and wheat are kings in Kansas, as well as in some other agricultural States. Kansas has astonished the world by her wonderful corn crops. She leads all the rest with a crop that has never been equaled, as the following comparison will show:

Year.	Bushels.	Year.	Bushels.
1878	80,314,971	1885	171,350,703
1879	108,704,929	1886	139,569,132
1880	101,421,718	1887	75,791,454
1881	180,760,542	1888	168,754,087
1882	157,005,722	1889	273,888,321
1883	182,080,526	1890	51,090,229
1884	190,370,686	1891	139,363,991

WHEAT.

If "Corn is King," wheat must be "Queen," in Kansas. The wheat crop of 1891 was very large and of good quality. Yet the average per acre will be more, and the total yield larger, each year.

The following is the production of wheat for the past fifteen years:

Year.	Bushels.	Year.	Bushels.
1874	9,881,383	1883	30,924,936
1875	13,209,403	1884	48,050,032
1876	14,620,255	1885	10,772,181
1877	14,316,706	1886	14,579,093
1878	32,315,358	1887	9,218,501
1879	20,550,936	1888	16,724,717
1880	25,279,886	1889	35,030,048
1881	20,479,089	1890	28,801,214
1882	35,734,866	1891	58,550,653

Appended is a comparison of the wheat and corn crops in Illinois and Kansas for the last seven years, and is shown here, since Illinois is generally considered the marvel of agricultural States. These statistics are taken from the report of the Commissioner of Agriculture at Washington, D. C., and are as follows:

Wheat, general average bushels per acre in Kansas, 1882 to 1888, both inclusive, 14.3 bushels. General average in Illinois, same period, 12.8 bushels.

Corn, general average, bushels per acre in Kansas, 1882 to 1888, both inclusive, 29 bushels. General average in Illinois, same period, 27 bushels.

Oats, general average, bushels per acre in Kansas, 1882 to 1888, both inclusive, 30 bushels. General average in Illinois, same period, 34.3 bushels.

From this it will be seen that Kansas leads Illinois in the average number of bushels per acre for corn and wheat, the principal cereals, and falls below only in oats.

THREE GREAT STAPLES.

Corn, Wheat and Oats are the three great staples which the soil of Kansas yields up most generously in return for the farmers' labor. The following table will give the reader a general idea of the yield of the State in five-year periods. Later on the crop yield will be treated more in detail:

Products of wheat (winter and spring) corn and oats, with the acreage and valuation in five-year periods:

WHEAT.

Periods.	Acres.	Bushels.	Valuation.
1866 to 1870	507,532	8,190,465	$ 9,099,418
1871 to 1875	2,123,905	32,269,786	29,426,366
1876 to 1880	8,235,220	107,083,108	82,524,357
1881 to 1885	8,872,848	145,061,083	95,377,823
1886 to 1890	8,167,825	104,703,376	69,668,017

CORN.

Periods.	Acres.	Bushels.	Valuation.
1866 to 1870	1,774,709	62,358,358	$ 35,479,115
1871 to 1875	6,047,289	197,822,847	59,385,912
1876 to 1880	13,362,514	485,257,623	107,931,240
1881 to 1885	23,078,502	788,072,179	224,132,054
1886 to 1890	31,922,001	709,093,223	190,340,240

OATS.

Periods.	Acres.	Bushels.	Valuation.
1866 to 1870	174,279	5,871,316	$ 2,380,778
1871 to 1875	1,202,846	36,994,637	11,168,762
1876 to 1880	2,197,981	67,376,610	14,011,744
1881 to 1885	3,248,143	123,483,700	27,884,744
1886 to 1890	7,332,869	214,383,929	50,392,968

INDIVIDUAL CASES.

These are general figures, of course, which group the yield of the State in wheat, corn and oats, in five-year periods; but let us get down to details. This is what the whole State has done, and can do again. In 1891, the State, as a whole, did a great deal better than in any year included in the foregoing table.

WHEAT FIELD, CENTRAL KANSAS.

The following sample records of wheat-raising show what individual farmers have done. There are thousands of Michigan and Indiana farmers who can do the same thing if they will get a Central or Southern Kansas farm.

Net profit in raising 155 acres of wheat; by A. Buckman, of Medicine Lodge:

The ground was prepared by being plowed and harrowed twice.

Cost of preparing the ground	$232 50
Cost of drilling or sowing	46 50
Cost of seed	145 00
Cost of cutting and stacking (binder used in cutting)	301 50
Cost of threshing	209 00
Cost of hauling to market	143 00
Total cost of growing and marketing crop	$1,127 50

Total product by weight, 3,700 bushels.

Price per bushel now offered, 85 cents.

Total value of product	$3,145 00
Total cost of growing crop	1,127 50
Net profit on crop	$2,017 50

Value of land per acre on which crop was grown, $15.

Net profit in growing 600 acres of wheat; by Reuben Lake, Lake City:

The ground was prepared by plowing.

Cost of preparing the ground	$ 600 00
Cost of drilling or sowing	300 00
Cost of seed	480 00
Cost of cutting and stacking (header used in cutting)	750 00
Cost of threshing	714 00
Cost of hauling to market	510 00
Total cost of growing and marketing crop	$3,354 00

Total product by weight, 10,200 bushels.

Price per bushel now offered, 70 cents.

Total value of product	$7,140 00
Total cost of growing crop	3,354 00
Net profit on crop	$3,786 00

Value of land per acre on which crop was grown, $10.

Net profit in growing thirty acres of wheat; by J. W. Pates, Kiowa:

Ground prepared by being plowed and harrowed.

Cost of preparing the ground	$ 45 00
Cost of drilling or sowing	10 50
Cost of seed	18 00
Cost of cutting and stacking (binder used in cutting)	67 50
Cost of threshing	42 00
Cost of hauling to market	12 00
Total cost of growing and marketing crop	$ 195 00

Total product by weight, 600 bushels.

Price per bushel now offered, 83 cents.

Total value of product	$ 498 00
Total cost of growing crop	195 00
Net profit on crop	$ 303 00

Value of land per acre on which the crop was grown, $12.

Net profit in growing twenty acres of wheat; by C. H. Landes, Brenham:

Ground prepared with a disk harrow.

Cost of preparing the ground	$ 10 00
Cost of drilling or sowing	6 00
Cost of seed	18 00
Cost of cutting and stacking (header used in cutting)	20 00
Cost of threshing	24 00
Cost of hauling to market	8 00
Total cost of growing and marketing crop	$ 86 00

Total product by weight, 400 bushels.

Price per bushel now offered, 80 cents.

Total value of product	$ 320 00
Total cost of growing crop	86 00
Net profit on crop	$ 234 00

Net profit in growing 320 acres of wheat; by Thos. J. Ross, Greensburg:

Drilled in corn.

Cost of preparing the ground	$ ....
Cost of drilling or sowing	69 00
Cost of seed	115 00
Cost of cutting and shocking (header used in cutting)	230 00
Cost of threshing	289 80
Cost of hauling to market	193 20
Total cost of growing and marketing crop	$ 897 00

Total product by weight, 4,831 bushels.

Price per bushel now offered, 76 cents.

Total value of product	$3,671 56
Total cost of growing crop	897 00
Net profit on crop	$2,774 56

Net profit in growing 25 acres of wheat; by C. P. Fullington, Belvidere:

The ground was millet stubble and prepared with a disk harrow or sod-cutter.

Cost of preparing the ground	$ 7 50
Cost of drilling or sowing	5 00
Cost of seed	12 50
Cost of cutting and stacking (binder used in cutting)	37 50
Cost of threshing	30 60
Cost of hauling to market	5 10
Total cost of growing and marketing crop	$ 98 20

Total product by weight, 510 bushels.

Price per bushel now offered, 83 cents.

Total value of product	$ 423 30
Total cost of growing and marketing crop	98 20
Net profit on crop	$ 325 10

Net profit in growing 100 acres of wheat; by G. H. Mustoe, New Murdock:

The ground was prepared by plowing.

Cost of preparing the ground	$ 100 00
Cost of drilling or sowing	25 00
Cost of seed	85 00
Cost of cutting and stacking (binder used in cutting)	125 00
Cost of threshing	132 00
Cost of hauling to market	22 00
Total cost of growing and marketing crop	$ 489 00

Total product by weight, 2,200 bushels.

Price per bushel now offered, 80 cents.

Total value of product	$1,760 00
Total cost of growing and marketing crop	489 00
Net profit on crop	$1,271 00

Value of land on which crop was grown, $12.

CROP FIGURES FOR 1891.

Now note the figures for the glorious crop year of 1891. In this memorable year the whole nation was blessed with bountiful harvests, and the record for the State of Kansas is here given in full from the report of the State Board of Agriculture. The soil of Kansas was, indeed, a mine of wealth for its fortunate possessors in 1891. What were

"THE MINES OF ORMUS AND OF IND"

when compared with the fruitfulness of the land in this favored State?

In field crops, in products of live stock and miscellaneous products, bountiful mother earth in Kansas gave up to the workmen no less a sum than $169,811,372. Which is, in round numbers, $15,000,000 more than the aggregate value of the total output of the farms of the State for 1889, the highest, up to that time, in the history of the Commonwealth.

STATE SUMMARY.

Showing the Total Acreage, Amount and Value of Farm Products, for the Year 1891.

		Acres.	Product.	Value.	
Winter wheat	bu.	3,582,006	56,170,694	$40,997,417	02
Spring wheat.	bu.	151,922	2,379,959	1,599,342	07
Corn	bu.	5,209,234	139,363,991	48,057,978	93
Oats	bu.	1,298,745	39,904,443	10,594,457	48
Rye	bu.	332,673	5,443,030	3,528,680	23
Barley	bu.	36,484	1,006,380	411,909	72
Buckwheat	bu.	3,405	44,874	40,386	60
Irish potatoes	bu.	69,542	5,483,900	2,689,637	39
Sweet potatoes	bu.	3,939	404,442	343,775	70
Castor beans	bu.	16,428	114,644	143,305	00
Sorghum		195,758	....	*2,060,423	00
Cotton	lbs.	1,782	445,500	35,640	00
Flax	bu.	388,184	2,049,055	1,639,244	00
Hemp	lbs.	247	172,500	8,225	00
Tobacco	lbs.	366	219,600	21,960	00
Broom corn	lbs.	58,225	28,261,450	918,497	12
Millet and Hungarian	tons	308,093	633,405	2,533,620	00
Timothy	tons	498,854	401,640	2,008,200	00
Clover	tons	158,589			
Blue grass	tons	101,869			
Alfalfa	tons	34,384			
Orchard grass	tons	5,701			
Other tame grasses	tons	63,702			
Prairie grass under fence	tons	4,997,886	1,369,945	4,062,546	50
Wool	lbs.	....	1,578,993	284,218	74
Cheese	lbs.	....	613,772	67,514	92
Butter	lbs.	....	29,084,837	4,362,725	55
Animals slaughtered, or sold for slaughter				37,922,192	00
Milk sold, other than that sold for butter and cheese				528,761	00
Poultry and eggs sold				2,559,297	00
Garden products marketed				818,958	00
Horticultural products marketed				1,199,468	00
Wine	gals.	....	170,369	170,369	00
Honey and wax produced	lbs.	....	365,221	73,944	20
Wood marketed		....	....	128,678	00
Grand totals		17,518,018	....	$169,811,372	17

*Syrup and forage.

LIVE STOCK.

Showing the Number, as Returned by the Assessors, and Value for the Year 1891.

	Number.	Value.	
Horses	776,533	$ 54,357,310	00
Mules and asses	77,170	6,173,600	00
Milch cows	690,611	13,812,220	00
Other cattle	1,770,591	30,100,047	00
Sheep	260,558	716,534	50
Swine	2,085,875	12,515,250	00
Total	....	$117,674,961	50

This interest is the principal source of wealth in the State, through which is marketed millions of bushels of corn and oats, thousands of tons of hay, sorghum and millet. It was this industry that first brought Kansas to the front as early as 1880, and it is this, to-day, which is building up the great city of Wichita, and making within the borders of Kansas a large commercial center and packing point. The acceptance of the principle, that the packing establishments must be near the source of supply, has brought to Wichita, from Kansas City, Jacob Dold & Sons, and from St. Louis, Francis Whittaker & Son, two of the largest packing firms in the United States, who have erected plants in this city with a combined capacity of 10,000 hogs and 5,000 head of cattle and sheep per day. The same reason compelled Armour, Swift and others to branch out from Chicago and eastern points to Kansas City and Omaha. They must now press farther west into Kansas and Texas, whence come the vast supply of cattle and hogs, and their objective point must necessarily be Wichita, the city that controls the entire territory between the Missouri river and the Rocky Mountains. The larger portion of the packing products of Wichita find their market in the south and west of this point. One of the leading meat packers recently said that Kansas was to be the great feeding pens for all the Western and Southern pastures.

The following abstract of the live stock interests of the State shows the gradual progress to its present enormous proportion:

Year.	Beef Cattle.	Milch Cows.	Swine.	Sheep.	Horses.	Mules, Asses.
1870	250,527	122,000	206,587	109,088	117,786	11,786
1882	971,116	443,381	1,228,683	978,077	398,678	56,654
1883	1,113,154	471,543	1,393,968	1,154,196	423,425	59,262
1884	1,328,021	530,904	1,953,144	1,205,267	461,136	64,809
1885	1,002,920	575,928	2,461,522	875,193	513,830	75,177
1886	1,462,736	627,481	1,965,149	652,144	572,059	83,642
1887	1,568,628	692,858	1,847,394	538,767	648,037	89,957
1888	1,619,849	742,639	1,433,245	492,744	700,723	92,445
1889	2,000,000	825,000	2,500,000	300,000	750,000	100,000
1890	1,696,081	674,705	2,192,231	281,654	716,459	78,346
1891	1,770,591	690,611	2,085,875	260,558	776,533	77,170

To illustrate the magnitude of this interest, the following table is given, showing the value of live stock and live stock products:

Year.	Value of Live Stock.	Value of Live Stock Products.
1885	$118,071,808	$37,190,647 06
1886	129,559,527	35,350,525 62
1887	126,558,042	37,545,263 74
1888	131,830,778	37,284,447 67
1889	116,191,465	40,762,488 62
1890	113,533,342	39,998,285 04
1891	117,674,961	41,010,250 00

STOCK FARM, KANSAS.

From which it may readily be seen that Kansas is specially fitted for the stock man; with its good pasture, lasting the year round, and its open climate, the industry is fostered as in no other State. The development of home markets and the growing of large crops have made it the profitable occupation of to-day.

WHERE KANSAS STANDS FIRST.

This is the way that a writer in *Camp's Guide* states the situation. It is all true and worthy of repetition :

First class in geography stand up.

What State was given the first premium on white corn at the World's Fair in 1885?
Kansas.

The first premium for yellow corn?
Kansas.

Which State received the gold medal at the World's Fair for the best corn in the world?
Kansas.

Which State received the premium on red winter wheat?
Kansas.

The premium on flour, graduated process?
Kansas.

The first and second premium on sorghum sugar?
Kansas.

The first for the best one hundred varieties of apples?
Kansas.

Which State took ten first and two second premiums on shorthorn cattle?
Kansas.

The first on Polled Angus?
Kansas.

The class is congratulated upon the knowledge of its lesson. You may go and play.

TREES AND SHRUBS.

Consider this list of trees and shrubs indigenous to Kansas soil. It has been prepared by Professor Kellerman, of the State Agricultural College, and is believed to be very full and correct. The common and not the botanical names are given as being more readily recognized:

Papaw.
Prickly ash.
Basswood.
Water ash.
Holly.
Burning bush.
Indian cherry
Buckeye—fœtid, sweet.
Soapberry.
Maple—sugar, soft, red.
Box elder.
Sumach—dwarf, poison.
Black locust.
Red bud.
Plum or cherry—wild or Canada plum, hog plum, wild black cherry.
American crab apple.
Thorn—cockspur, red haw, black, gray, service berry.
Bemuld — gum elastic, Southern blackthorn.
Persimmon.
Ash—red, white, green and blue.
Catalpa—bean tree, Western.
Sassafras.
Elm—red, white-winged.
Hackberry.
Red mulberry.
Osage orange.
Sycamore.
Walnut—white, black.
Hickory—shellbark, big shellbark, black, pignut, swamp, bitter pecan.
Oak—white, burr, swamp, black, yellow, jack pin, laurel.
Ironwood.
Water beech.
Birch.
Willow — black, long-leafed, glacous, heart-leafed.
Poplar.
Cottonwood.
Juniper.
Yellow pine.

WILD FLOWERS.

First among the flowers comes the *Tucca Filamentasa*, with its strong stalk, with thick, clustering, large white blossoms. It is growing rare with advancing civilization, but it still blooms in Kansas, and sheds its delightful fragrance. White Poppy, Golden Evening Primrose, Spring Cactus, Canterbury Bells, blue and white, Monk's Hood, Acacia, Wild Roses, St. John's Wort, Golden Rod, Dark Purple Asters, and the "daisy of the prairies, which blooms in red, white and blue," form only a partial list of the indigenous wild flowers found in this favored State.

TAME GRASSES.

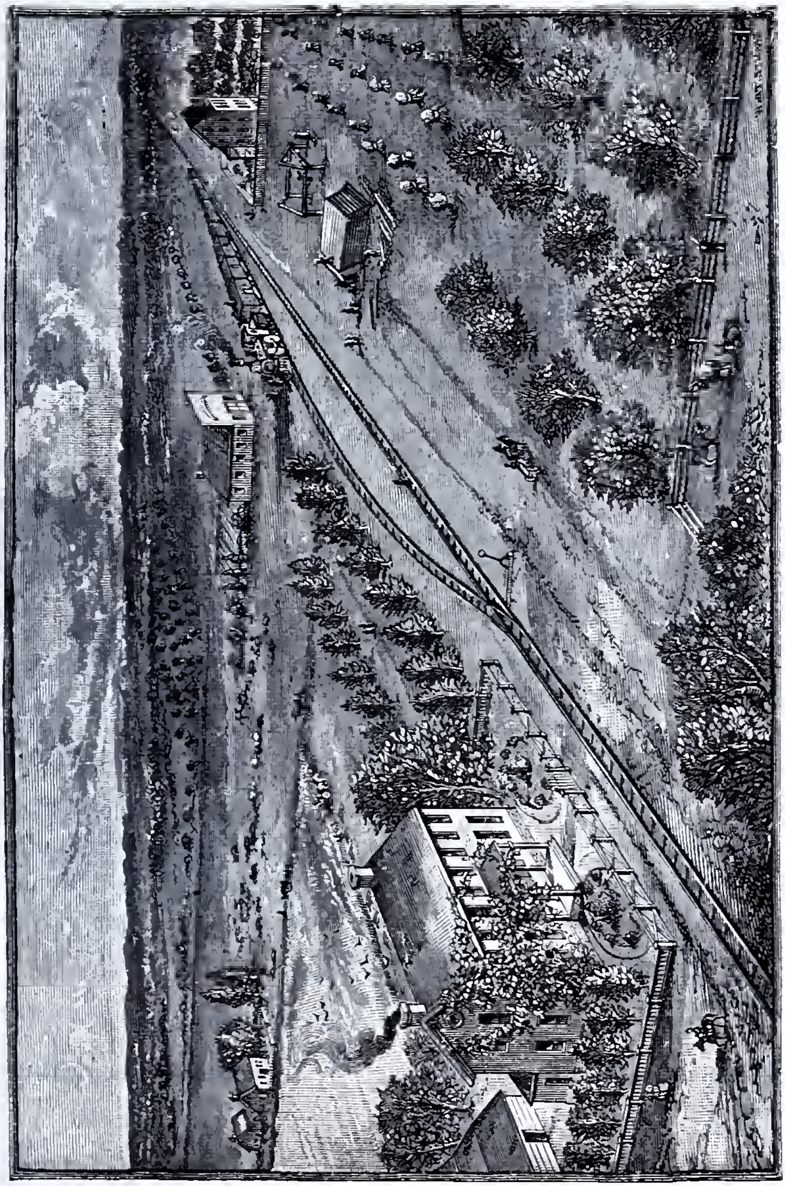
The native grasses of Kansas number more than one hundred varieties. No part of America is more richly blessed in this respect. When Coronado, the Spaniard, first set foot on the plains of Kansas, leading his band of adventurers in search of the country of Quivera and its fabled cities of gold, he found the plains covered with buffalo, tranquilly grazing on the rich grasses. The buffalo, mesquite and gamma grasses, the products of a dry climate, have gradually disappeared from the eastern portion of the State, where advancing civilization, or some other cause, beyond the ken of mortals, has brought a steadily increasing rainfall. The coarser "blue stem" is now the dominant grass for a distance of 200 miles west from the Missouri river. It is a strong, vigorous growth, and, in the bottoms, grows very tall—higher than a man's head. Cattle graze upon it eagerly, and it yields from one to three tons of hay per acre. In the center of the State the buffalo and the mesquite still compete for supremacy with the blue stem, but the wild grasses are steadily giving way. In the western portion of the State, the short grasses predominate, and furnish the very best pasturage known in the grazing world. They spring into life in March or April and grow until the suns of July and August dry them on the ground. They are the only grasses which furnish perpetual pasturage. In the old days the buffalo lived and throve on them, and, to-day, cattle, sheep, horses, mules, deer, and antelope subsist upon them all the year round.

Western Kansas is the heart and center of the old buffalo range, and it is, to-day, the finest grazing and herding ground on earth.

ORCHARDS AND VINEYARDS.

Fruit culture generally comes a little late in the development of a new State, but in Kansas the climate and soil were so especially adapted to the growth of fruits that no time has been lost, and the extent of fruit culture in Eastern and Central Kansas is a matter of surprise to strangers. No section of country, from the Atlantic to the mountains, gives more prolific crops of fine fruits than Kansas. Here is the list of successfully grown fruits: Apples, peaches, grapes, apricots, raspberries, pears, cherries, plums, nectarines, blackberries, strawberries.

The quality of Kansas fruits also deserves comment, for they are admittedly of fine flavor and beautiful appearance. Note this partial list of medals and awards won by Kansas fruit exhibits:



FRUIT AND GRAIN FARM (SOUTHERN KANSAS.)

Great golden medal of National Pomological Society "for a collection of fruit, unsurpassed for size, perfection and flavor." Philadelphia, 1869.

Highest premium, American Pomological Society for "largest and best display of fruit, unequaled in size, beauty and elegance." Richmond, Va., 1871.

Medals and diplomas from Pennsylvania Horticultural Society, St. Louis Fair, New York State Fair (Albany), New Hampshire Agricultural Society, New England Fair (Lowell, Mass.), Illinois State Fair, Minnesota State Fair, and many others.

The following table gives the total number of fruit trees in bearing for the years 1890 and 1891:

	1890.	1891.
Apple	5,111,501	5,478,284
Peach	4,562,716	1,255,087
Pear	124,170	229,152
Plum	616,702	400,806
Cherry	1,172,143	562,317

NURSERIES, GARDENS, VINEYARDS AND SMALL FRUITS.

	1890.	1891.
Acres in nurseries	13,936	4,991
Value of horticultural products marketed	$682,828	$1,199,468
Acres in raspberries	3,420	3,015
Acres in blackberries	4,852	4,140
Acres in strawberries	2,364	2,286
Value of garden products marketed	$743,979	$818,958
Acres in vineyards	8,672	7,035
Gallons of wine made in year ending March 1st	149,963	170,369
Value of wine	$149,963	$170,369

In this connection it is proper to remark that Kansas is a prohibition State. The grape vine thrives in Kansas; and the grape grower of other States will be interested in knowing that no grape rot comes in June to blight his hopes, as in States of lower elevation than Kansas. The market for fruit is growing larger every year.

BEES AND HONEY.

The following table, from the report of the State Board of Agriculture, shows the condition of Apia culture:

	1889.	1890.	1891.
Number of stands of bees	30,107	39,120	46,238
Pounds of honey produced	282,931	454,382	352,962
Pounds of wax produced	3,185	5,638	5,259
Value—honey and wax	$51,500 88	$92,004 00	$73,944 20

THE SUGAR INDUSTRY.

By legislative enactment, a bounty of three-quarters of a cent per pound is paid upon all sugar manufactured in the State. During the year 1891, three sugar factories were operated in Kansas—one at Medicine Lodge, one at Fort Scott and one at Topeka. Four thousand acres of land were planted in sorghum for the use of these factories, and 1,078,245 pounds of sugar were manufactured. The results obtained at Fort Scott warrant State Sugar Inspector Kellogg in declaring that the business can be successfully conducted when the required conditions are fully complied with.

COTTON AND SILK.

The cultivation of cotton in Kansas is as yet experimental; the report for 1891 shows 1,782 acres in cotton, producing 445,500 pounds, valued at $35,640.

The parties engaged in silk culture, report favorable progress.

SALT.

The manufacture of salt is but recently developed, although at Hutchinson is manufactured the salt required for the western market, and heavy inroads are being made in the territory heretofore held by Michigan and New York salt works.

The salt from the marshes of Northern and Central Kansas were utilized by the Indians and buffaloes for ages, and the white settlers discovered their existence early in the occupation of the territory. Investigations of these marshes and the geology of the State led Professors Mudge and Swallow to express the belief a quarter of a century ago, that rock salt could be obtained by boring. The perspicacity of these gentlemen was not appreciated, however, until in 1887, when, while prospecting for coal, a bed of rock salt was discovered at Ellsworth, at a depth of 730 feet. This was quickly followed by similar discoveries at Hutchinson, south of the Arkansas river, at a depth of 450 feet, while the following year, the bed was penetrated at Sterling and Nickerson in Reno county; Great Bend, in Barton county, and Wellington, in Sumner county, thus proving the existence of a salt bed varying in thickness from 75 feet at Anthony to 300 feet at Hutchinson, almost across the entire State from north to south, and at least fifty miles in width.

Hutchinson is the geographical center of this great salt deposit, so far as discovered, and the greatest thickness of the bed is there obtained. It is here the salt industry has developed into one of the most important in the State, for here there are fourteen salt blocks in active operation, having an aggregate capacity of 4,775 barrels daily.

The method of manufacturing is somewhat modified from that employed so successfully in England. The brine is obtained by forcing water from the surface into the body of solid rock salt, when, by agitation, it becomes surcharged by the dissolving salt, and, by forcing the surface water below, the brine is forced back through another pipe to the receiving tanks above. Taking the G. and H. works as an illustration: There are two wells, and six receiving or storage tanks, somewhat elevated, 50 feet long, 20 feet wide and 5 feet deep. The brine is drawn off into four wrought iron evaporating pans. Under one end of each pan are three furnaces, and these open into a large chamber beneath the pans. The brine enters the pan at the further end from the fires, gradually passing over the hotter parts of the furnaces, and, as it reaches the saturation point, by the rapid evaporation, the salt crystals form and sink, and are raked out upon a sloping platform, whence, after draining, it is passed into cars and taken to the warehouses, where it is sufficiently dried and otherwise treated.

Rock salt is being mined at Lyons, Kingman and Kanopolis, but, as the capacity is so much greater than the market demands at present, they are not likely to be paying investments; as the demand for salt as a fertilizer and for smelting flux increases, the industry will be a more profitable one.

The energy with which the salt industry is being developed suggests the question whether the supply will hold out. Of this there can be no doubt, as it has been demonstrated that there are several hundred square miles of the deposit, from 100 to 300 feet thick. Professor Hay is here quoted: "A square mile of salt, 100 feet thick, yields 1,403,920,000 barrels; the present consumption of salt, for all purposes, in the United States is 12,000,000." Thus, at the present consumption of salt, it would require 117 years to consume one square mile of this vast body.

The plants owned and operated by the Hutchinson Salt Company are known by these names, respectively: The Hutchinson Plant, The Crystal Plant, The Pennsylvania Plant, The McFarland Plant, The Nickerson Plant. Other plants in operation in the Kansas field, the product of which is bought, sold and handled by the Hutchinson Salt Company, are:

The Sterling Salt Co., of which T. H. Brown, of Sterling, is president, and P. P. Truehart, secretary.

"The Anthony Salt Co.," of which T. B. Smith, of Anthony, is president, and Geo. W. Maffet, secretary.

"The Wellington Salt & Mining Co.," D. A. Espey, of Wellington, president.

The Moore Salt Plant, of Kingman, Kan., controlled by the Farmers' & Drovers' Bank, of Kingman, Kan.

"The Crystal Salt & Mining Co.," of Kingman, Kan., E. W. Hinton, president.

And the following, which are located at Hutchinson, Kan.:

The Diamond Salt Plant, Syms Ely, secretary and treasurer.

The Star Salt Co., R. E. Conn, president; Will Randle, secretary.

The Queen City Salt Plant, J. R. Van Zandt, president.

The Union Ice & Salt Co., Jas. F. Redhead, proprietor.

The Bartlett Salt Plant.

The Western Salt Plant, controlled by Paul Phillips, of Kansas City.

Besides the above named plants, there is in operation, independent of the above named companies, the Kansas Salt Co., of Hutchinson, who own and operate the Kansas Salt Co. Plant, the Gouinlock & Humphrey Plant, and the New York Plant.

The total product of the Kansas field is estimated as follows, by John F. Vincent, secretary and assistant treasurer of the Hutchinson Salt Co.:

Wellington	40,000	barrels.
Anthony	125,000	"
Kingman	50,000	"
Sterling	75,000	"
Nickerson	75,000	"
Hutchinson	1,000,000	"
Total output of the Kansas field	1,365,000	barrels.

The total output of the Kansas field is 1,365,000. To value this at $1 per barrel would make total value of product $1,365,000. This statement refers to evaporated salt only and has no reference to mined rock salt.

The Royal Salt Co., at Kanopolis, Kan., shipped, during 1891, about 10,000 tons of rock salt, for which they received at the mine about $30,000.

LEAD AND ZINC.

The development of vast deposits of valuable lead and zinc ores in Southeast Kansas, succeeding the discovery of inexhaustible fields of coal in close proximity, has proven one of the most potent agencies in bringing Kansas before the scientific and commercial world, in that it opened up a new field for the expenditure of energy, and a safe investment to capital; placed Kansas in the category of mineral and metal-producing States of the Union, and added another jewel to Uncle Sam's crown by building up, in the midst of these great stores of nature, one of the largest zinc-producing cities in the world—Pittsburgh, Kansas. Early in the development of these mineral deposits it was discovered that only the richest ores could be handled, owing to the cost of transportation; in fact, notwithstanding the care and labor expended in concentrating the ores, it dawned upon the mine owners that their "dumps" of low grade ore were growing to enormous proportions, and finally became a burden. It was then they cast about to secure a nearer market, and, with the inducement of cheap fuel at their very doors to offer, capitalists were persuaded to erect smelters to reduce their product to spelter, or commercial pig zinc. At first it was no less than an experiment, but the obstacles were overcome in time, and, in consequence, there are now in the district nine immense zinc-smelting plants, operating in the aggregate fifty-eight furnaces, which have a daily capacity of handling and reducing 400,000 pounds of ore, which yield a product of 135,000 pounds of spelter. Of these smelters six are in Pittsburgh and one each in Weir City, Scammonville and Girard, the latter two with capacities of six and two furnaces respectively, while the Weir City plant is the largest zinc smelter in the United States, operating as it does six blocks, or twelve furnaces, and turning out 50,000 pounds of zinc spelter daily. Weir City and Pittsburgh are in the center of this rich coal and mineral bearing area.

Pittsburgh has become a railway center second to few in the West, through these agencies, and the additional advantages held out by an inexhaustible supply of cheap fuel, which has brought numerous manufacturing industries within her gates, with others continuously knocking for admission; for with these lines of railway ramifying in every direction, bringing raw material from, and distributing manufactured articles throughout Missouri, Arkansas, Texas, Indian Territory and the great

West, a field is drained of its staples, and a market created for the products of the factories exceeding in value any possessed by a new State.

A decade ago Pittsburgh was struggling for an existence, to-day she has a population of 10,000. The product of the coal mines surrounding her, until a few years ago, was nominal, while the mines adjoining the coal belt on the south were in their infancy, to-day three thousand men are employed in the Pittsburgh coal mines, several hundred in the vicinity of Weir City, over a thousand in the zinc mines, and as many in the smelters of Pittsburgh and Weir City alone; yet neither the coal fields nor mineral deposits are fully developed, in many places hardly prospected.

The need for additional smelters is becoming more apparent daily; indeed, so apparent has it become that the Weir City Smelting Company is arranging to double the capacity of their Pittsburgh plant as soon as practicable. Mr. A. W. Gifford, one of the best authorities on mining and smelting in the West, has prepared some interesting figures regarding the earnings of the smelting plants of Pittsburgh and illustrative of what the investment of capital in this field would bring. Taking as a basis a capital of $100,000, he demonstrates the fact that, by using one-half the sum to construct a plant of eight furnaces, and reserving the balance for operating expenses, it would yield a thirty per cent dividend annually on the investment. Thus he reasons: Daily expenses, twenty-five tons ore at $23 per ton, $575; twenty-five tons fuel at fifty cents per ton, $37.50; repairs, supplies, and office expenses, $35; pay roll, $170; total, $817.50. Output, 20,000 pounds spelter at 4½ cents, $900. Net daily profit, $82.50, or for 365 days, $30,112.50. These figures are based on actual earnings of other plants. Mr. Gifford stakes his reputation upon the correctness of these calculations, and as his reputation as a careful and conservative man and an expert is beyond question, the estimate is worthy of notice. Mr. Gifford has made very thorough investigations of these subjects and would be glad to give the benefit of his researches to all inquiring.

That the business is safe and profitable is evidenced by the fact of the Pittsburgh and St. Louis works adding six furnaces to their plant, the Granby adding two, and the Weir City Company planning to add four to their Pittsburgh plant, while no less than three companies have been organized for the purpose of each erecting eight furnace plants in

Pittsburgh. In addition to these new movements it is proposed to put in one of the largest zinc rolling mills in the country here, in order to more cheaply handle the products of the smelters. Already over 30 per cent of the zinc ores of the United States are smelted in this district, and, with the construction of this proposed rolling mill, additional smelting works will be put in at Pittsburgh with sufficient capacity to handle every pound of zinc ore produced in Kansas, Missouri and Arkansas, where over 60 per cent of the entire output of the United States is secured.

Pittsburgh has recently added another star to her escutcheon, by securing the first plant of the Chick short-method process of smelting gold and silver ores ever put into active operation. The secret of profitably handling base clay and other refractory ores has been sought since scientific research was begun, but it was left for Mr. George H. Chick, one of the most practical and best informed chemists and mining men in the United States, to discover the secret, and it is the application of this secret that is working a revolution in the mining world of to-day. To Mr. Frank Playter, who has large coal interests near Pittsburgh, and Mr. Gifford, who is largely interested in mines in the republic of Mexico, is due much of the credit of securing to Pittsburgh this plant. True, Mr. Playter has fuel to sell, and Mr. Gifford, ore that must be worked by this process; while they may be benefited, hundreds of others will also. That the plant has proven a grand success will be understood, when it is explained that it has been in operation but four months, and, although it has but twelve furnaces, it has paid a monthly dividend of 5 per cent to its stockholders. So successful has been the plant that it has been determined by the directory to immediately increase the capacity of the works by adding fifty furnaces to the twelve now in operation, thus securing a capacity for handling 100 tons of ore daily. It is needless to say that the stockholders of this enterprise are more than gratified with the success attained, for the directory is receiving urgent propositions from different parts of the United States and from foreign countries, toward securing plants to treat their refractory ores by this process.

STONE, BRICK AND LIME.

Stone suitable for building purposes is found in abundance in nearly all parts of the State. The varieties include magnesian limestone, blue and gray limestone, and great quantities of sandstone, and of flagging stone. Stone from the Kansas quarries is used in some of the finest buildings in the country. For churches, court houses, State and municipal buildings, nothing can be found superior to the product of the various quarries of the State.

Material suitable for the manufacture of ordinary brick exists everywhere. The bars along the water courses furnish sand. The limestone affords abundant supply of low-priced quicklime. Indeed, all the requisites of building exist in abundance, and are consequently remarkably cheap in all parts of the State.

COAL.

Inexhaustible beds of bituminous coal, valuable for fuel and for manufacturing uses, are found in the eastern and central districts of the State. In several counties, the mining and shipping of coal constitute one of the important industries, and a constantly increasing source of wealth. The business affords employment and support to a large mumber of persons, and it is rapidly growing in extent and importance.

The workable deposits range in thickness from twenty to fifty inches. The main coal area is traversed by several important lines of railway, thus making directly tributary to this district an immense outlying region which is crowded with thriving towns and prosperous farms.

GAS.

A fine quality of natural gas has been discovered in some parts of the State, and is being successfully used for light, fuel and manufacturing purposes, at a saving over other kinds of fuel and light of from twenty-five to thirty per cent.

HUNTING AND FISHING.

Once upon a time, and not so very long ago either, the shaggy-fronted buffalo roamed in countless herds over the Kansas plains. That day is past, of course. Deer and antelope, once plentiful all over the State, are not found now in the eastern portion, but in the western section they are still seen, and furnish the hunter with all the pleasurable excitement of big game shooting.

There is plenty of small game in Kansas, and in season the markets are well stocked with quail, ducks, prairie chickens, plover, curlew, snipe, geese, rabbits, etc. By legislative enactment prairie chickens and quail are protected until well grown, and are shot only in October, November and December. Netting and trapping game birds are prohibited, and, as the shelter of hedge and timber increases, quail are multiplying all over the State.

From October to April wild geese and ducks abound, feeding on the wheat fields in day time and seeking the rivers and ponds at night.

We have known a single sportsman to bring down from fifty to one hundred geese and ducks in one day, all conditions being favorable.

The ducks, which are of all varieties, from the delicate teal to the far-famed canvas back, Mallard, sprigtail, butter ball, spoonbill, red head, etc., abound—a few nesting in the State and staying through the year, though the great majority migrate.

In April several varieties of plover appear, and the smaller kinds afford good sport all during the spring and fall. The large brown plover and curlew are plenty in April and May, but go north for the summer.

While Kansas sportsmen ought to be satisfied with such a goodly array of game, they sometimes lay for heavier prey, and consequently will frequently be found silently folding their tents and quietly stealing over the border into Uncle Sam's great game preserve of the Indian Territory. There the wild turkeys still exist in great numbers. Deer are abundant, and occasionally a black bear may be seen in the cañons of the Medicine river.

Kansas does not claim to be a great State for fishing, still all the streams with rock bottom abound in the gamey black bass, and favored sportsmen have caught specimens weighing over seven pounds. In the streams and ponds of sandy or muddy bottom, are found catfish, buffalo, eels, sunfish, perch, and occasionally a wall-eyed pike. The German carp is being cultivated, and thrives in Kansas waters.

It is emphatically true, as shown by the post office returns, that the citizens of Kansas are a reading people. As a rule, the press of Kansas is able and public spirited, and it has had its full share in achieving for the State its wonderful progress at home, and in winning for it its honorable reputation abroad. From the peculiar circumstances connected with its early history the newspaper press of Kansas has always drawn superior men to the ranks of its editors. Among them are men who, in point of knowledge of books and the world, of wit and humor, of clear and forcible style, of fearless and chivalric courage, are easily the equals of the most distinguished editors this country has produced.

CITIES.

There are eight cities in Kansas with populations ranging from 10,000 to 36,000. Twenty-eight cities with 2,500 and upwards, and sixty-five cities containing 1,000 and upwards.

It may, perhaps, be well to speak briefly of some of these more important cities. As our space is limited, an effort will be made under this head to give *facts* without elaboration; to furnish the reader with information he will most need in regard to the cities of Kansas. It is presumed that this book will be largely used by farmers, mechanics, artisans and laborers. The interest of this class of readers in the cities of the State lies along the line of markets and opportunities for employment. Here, then, are the facts and figures carefully condensed.

TOPEKA.

Capital of the State and County seat of Shawnee county.

Population, 31,007.

Its public schools employ 125 teachers.

Four great railroad systems enter the city, where official headquarters, workshops, etc., give employment to at least 3,000 men.

It is the most important milling center west of St. Louis; there being nine mills with a capacity of 2,500 barrels per day.

The principal streets are from eighty to one hundred and thirty feet in width, and the residence streets are beautifully parked and shaded. Ten miles of street are paved with asphalt, stone, cedar blocks, and vitrified brick, costing over $1,100,000.

The United States Court House, Pension Office and Post Office Building, erected in 1882, at a cost of $300,000, occupies a prominent corner in the business center of the city.

The State Asylum for the Insane is located west of the city, on spacious grounds, and occupies five immense buildings, recently erected, with all modern improvements.

The State Reform School is located on a fine farm of one hundred and sixty acres, north of the city, and has four large buildings with accommodations for two hundred boys.

There are over one hundred church organizations in the city, occupying forty-eight church edifices. Many of these are magnificent structures, and the church property is valued at $632,000. The bishops of the Methodist Episcopal and Episcopal churches reside here, and preparations are made for the construction of an Episcopal Cathedral to cost $250,000.

The Topeka Free Public Library occupies a beautiful building on the State House grounds, erected for its special use at a cost of $50,000. It contains over 10,000 volumes.

State Library, owned by the State of Kansas, is one of the largest and best in the country, and is open to all during business hours.

Library of the State Historical Society is also kept in the State House. It contains 35,000 volumes, and is particularly rich in historical works.

There are fourteen banks in Topeka, with a combined capital of $3,000,000.

The city is lit with electric lights and has a comprehensive telephone system.

The State Printing House employs 420 hands and pays out $261,000 in wages annually.

Packing houses employ a large number of men, and do a business of $350,000 per annum.

Two sash and door factories, with a business of over $200,000.

Starch works, paying in wages $1,000 monthly.

Boiler works, brick yards, feed mills, linseed oil mills, preserving works, cracker factory, furniture factory, cornice works, and establishments producing stoves, vinegar, shirts, overalls, cigars, confectionery, mattresses, harness, clothing, artificial limbs, etc.

The actual valuation of all real, personal and railroad property in the city is over $40,000,000.

Topeka is clean, well drained, and a healthy city. The climate is salubrious, and with the natural location and splendid sewer system, perfect drainage is obtained.

There are twenty-five miles of electric railway, operated by the Thompson-Houston system of overhead wires, and the system is the perfection of cheap city and suburban transit.

The Topeka City Railway Company has fifteen miles of road, and fifty cars run by horse-power, but soon to be superseded by electricity.

There are also two suburban motor lines, operating ten miles of track, with ten cars and steam motors.

Topeka is well supplied with good hotels, sufficient to accommodate the largest gatherings and conventions.

There are thirty-six daily and weekly newspapers in Topeka.

WICHITA.

The county seat of Sedgwick county; population, 23,853.

Twenty-three miles of electric street car lines.

Wichita is one of the best railroad points in Kansas. She has no less than ten lines running to all points of the compass. The Missouri Pacific system gives her direct connection to Kansas City, thence east and north; also with Denver, Colo. It has likewise a line running into the southwestern part of the State.

The stock yards are now doing a fine, steady business. These yards were first opened in 1887. They had hardly got started when they were burned out on the 18th day of October. On the 1st day of November, 1888, they were again opened. They cover sixty acres of ground—fourteen acres under shedding. They have a capacity for 5,000 cattle and 10,000 hogs. They have 125 hydrants. The capital stock, $600,000, is all owned in Wichita.

Wichita has every advantage of location. She is situated on the east bank of the Arkansas river, near the junction of that stream with the Little Arkansas, in the finest valley west of the Mississippi.

There are eighteen public schools, including a high school.

Wichita is located in the bosom of the great Arkansas valley, better known as the Happy valley, fifty miles north of the Indian Territory line and two hundred miles west of any other city. By her fortunate location she holds the key to the trade of the great Southwest.

Wichita is the wonder of America and the metropolis of the Southwest.

She is a great receiving and distributing point.

She is the only packing center in Kansas, the combined capacity of the two packing houses being 5,000 hogs and 1,000 head of cattle daily.

She is the center of the finest hog and cattle region in the world.

She is a large wholesale and manufacturing city.

She has absolute control of a country 400 miles square.

Wichita is a city of magnificent buildings, which have cost millions of dollars.

She has an extensive system of water works.

A splendid sewerage system.

An excellent gas and electric light plant.

The finest equipped and most efficient fire department in the West.

Good telephone service.

LEAVENWORTH.

The oldest city in the State, population 19,768.

Leavenworth's strong point is coal. In 1860, coal cost sixty-five cents per bushel; in 1870, the first coal shaft had been sunk, and a twenty-four inch vein struck; since then, four workable veins have been discovered, the first, at 713 feet, twenty-two inches in thickness; the second, at 738 feet, twenty-four inches in thickness; the third, at 998 feet, twenty-six inches in thickness, and the fourth, at 1,030 feet, twenty-eight inches thick. From actual tests it is known that the coal veins cover 200 square miles, and contain 1,940,000 tons of coal. The best coal is sold at $2 per ton, and slack, suitable for factory purposes, at 40 cents per ton. Two million dollars are invested in coal mines, and $20,000 per week are paid in wages.

There is no better corn market in the West; about seven thousand bushels per day being the capacity of the various mills, glucose works, etc.

Fort Leavenworth, the Soldiers' Home, and a large part of the city are built with bricks made from clay found near the city; and bricks are shipped to Kansas City and other markets. Clay suitable for making vitrified bricks for street paving has been discovered, and large works have been erected on the Soldiers' Home grounds, at a cost of $30,000, and another factory has been established in the city at a similar cost, so that 60,000 paving brick a day are now being made.

This is the great stove center of the West. The Great Western Stove Company is the largest but two in the world; they make 60,000 stoves in a year. The Union Stove Works is another large enterprise. Together they give employment to a large number of men. The stoves are sold in every State in the Union.

The largest bridge works west of the Mississippi river are at Leavenworth, and give employment to a large number of men. The furniture factories, planing mills and cooperage works are the very best of their kind, as are also the packing-houses and printing establishments.

ARSENAL AVENUE, FORT LEAVENWORTH, KAN.

Leavenworth can fairly be called the manufacturing center of the West, for it has factories of almost every kind. They nearly all commenced in a small way, and have grown up to their present dimensions.

Leavenworth county is not only a rich farming county, but it is rich in fruit. More apples are shipped from this county every year than from any other county in America. Farmers are prosperous; having a good cash market for all they grow, they have an advantage over other counties.

South of the city 1,200 veterans find comfortable quarters in the Soldiers' Home, maintained by the Federal Government.

The State Penitentiary and the United States Fort are located near the city This most important military post has charge of issuing all necessary stores for the department of the Missouri.

ATCHISON.

Atchison was settled in 1854 and has a population of 13,963.

Atchison lies in a sort of an amphitheatre, its business center being in the valley of a creek, locally known as White Clay creek, and its residences occupy the hills which rise on either side.

It is within one hundred miles of the geographical center of the United States, and is nine hundred feet above the sea.

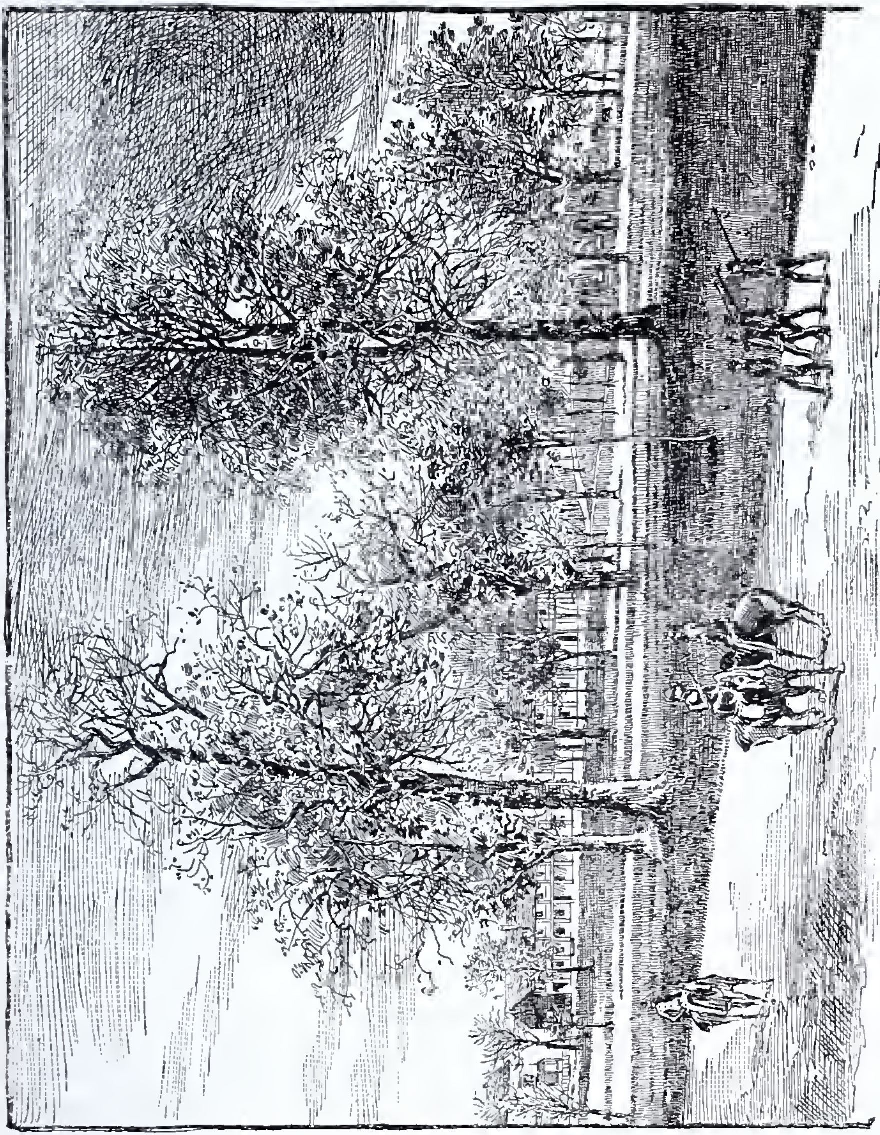
The territory included in the city proper is about two and one-half miles north and south, by two miles east and west. Its surface is irregular, rising from the low, level bottom ground of the creek to the bluffs and hills nearly two hundred feet high. The natural drainage is unsurpassed, and the high elevations furnish beautiful and healthful sites for residences.

The water supply of the city is in first-class hands, and is ample for all purposes.

The city is lit by gas and electricity, and its streets are well paved.

The Missouri river is here spanned by a steel railroad and highway bridge, by which six lines of railroad reach the city from the east. Seven railroads run west from Atchison, making thirteen in all.

Atchison's wholesale trade now amounts to more than $60,000,000 annually. The city is a leading wholesale town of Kansas, her chief market being this State and Nebraska. The grocery trade stands first, with two firms at its head doing between them seven million dollars of business, besides other smaller concerns. Lumber sales run up to thirteen million dollars. In grain her elevators handle some ten million dollars worth of cereals. The output of flour from the four roller mills is about fifteen hundred barrels daily, when running full. The wholesale drug house sells over one million dollars worth of goods annually; the other lines of jobbing trade represented are hardware, notions, gents' furnishings, dry goods, tin-plate, produce, seeds, plumbers' supplies, coal, sash and blinds.



VIEW OF PARADE GROUNDS, FORT LEAVENWORTH, KAN.

FORT SCOTT.

The county seat of Bourbon county; has a population of 11,946.

Fort Scott presents considerable attraction to manufacturers. It is the center of a country where nature has provided plenty of raw materials for factories, such as limestone for building and smelting purposes, cement rock equal to the Louisville, clay for all kinds of heavy pottery, fire clay, timber of all kinds in great profusion, sandstone flagging, flax, sugar cane, straw for coarser class of paper, the best of brick clay, broom corn. An inexhaustible supply of coal underlies the entire city; also natural gas wells abound in the neighborhood. The mines to the south yield abundantly lead and zinc.

This city is now one of the important railroad centers to the Southwest, being situated at the intersection of three great trunk lines, the Missouri Pacific, the Kansas City, Fort Scott & Memphis, and the M., K. & T. Eight lines in all center here. The Missouri Pacific has recently completed two more, and a belt line around the city.

It is an important jobbing center, being the source of supply for the mining and agricultural towns of the surrounding region. Its public improvements are complete, consisting of water works, sewerage, electric light plant, illuminating and fuel gas plant, telephone exchange, and every metropolitan convenience; several costly hotels, U. S. court house, normal school, seven public school buildings, four strong banks, aggregating $1,000,000 capital, seven newspapers, two journals, seven miles of street railway, soon to be increased and operated by electric power. Natural gas is found in considerable quantities at a depth of from 300 to 800 feet, and fuel and lighting are obtained at very small cost. The town is built in the valley of the Marmaton River, which furnishes ample waterpower for all purposes. Good drainage and pure drinking water render it exceptionally healthy, the death rate being among the lowest in the United States.

HUTCHINSON.

The salt industry of Kansas centers at Hutchinson, which is the county seat of Reno county. Population, 8,682. (The salt industry is treated at length elsewhere in this volume).

Hutchinson has five different railroad lines; a perfect system of street railways, which are equipped with the finest and latest improved machinery. Also a complete system of water works and electric lights, the central plant of the company being constructed at a cost of a quarter of a million dollars. The city is supplied with a complete system of sewerage. The wholesale groceries and dry goods houses are among the largest in the West, and are doing a flourishing and rapidly increasing business. The business blocks and residences of the city are noted for their elegance and costliness.

The State Reformatory is located near here.

LAWRENCE.

Population, 9,997. Founded in 1854.

Its numerous schools, colleges, churches and literary societies, have given it a celebrity enjoyed by few places anywhere in the great West.

Around these varied interests has gathered a population of refined, educated people whose influence and association are peculiarly favorable to the student's work. It would be difficult to find a place in which young men and women can pursue a course of studies under more favorable circumstances, with greater chances of success or with less expense. First among the attractions of the City of Lawrence, is the State University. Situated upon the lofty brow of Mount Oread, it overlooks the city at its base, the Kansas River, winding around the Delaware bluffs, the timber-lined Wakarusa, and a line of hills beyond.

Another attractive feature of Lawrence is Bismarck Grove, one of the grandest natural parks in the country. Art has added to its beauties, and now there are three beautiful lakes in it, fed by water works, on which are kept several row boats for the use of the visitor. Bismarck Grove has become famous for its fine herd of buffalo and deer, and hundreds of people visit the park to see the last remnant of the "Monarch of the Plains."

The United States Indian School, better known as the Haskell Institute, is located just outside the city limits. There are four very large buildings constructed so as to form a half circle, and here are being educated some four hundred Indian girls and boys, from about forty different tribes. It is an industrial school, and all must work at some trade a half day and go to school the other half. The boys are uniformed and the six companies form the Haskell Institute Battalion, which, headed by their band of Indian boys, makes an imposing appearance. Many visitors go out to the school to witness their weekly drills.

The rare advantages offered to manufacturers by the almost unlimited water power; the numerous railroads, directly connecting it with all points of the country; the facilities for securing either a classical or commercial education—all combine in bringing hundreds of people to the city.

SALINA.

Population, 6,149. Salina is in the very center of the wheat belt, with inexhaustible agricultural resources surrounding it. It has become a great shipping point, and its large elevators and mills do an enormous business. In like proportion its other business interests have developed—wholesale and retail houses, manufactories, packing establishments, gas works, electric lights, street railways, book binderies, in fact, everything that goes to make a large and prosperous city.

Salina is proud of her schools and colleges. Its five large public school buildings accommodate about one thousand scholars, and its advanced institutions of learning have already acquired more than a State reputation. The Normal University, erected at a cost of $40,000, attracts scores of students every year; the Kansas Wesleyan, controlled by the Methodist denomination, has exceeded the expectations of its founders, and the St. John Military Institute offers special courses that the young men are rapidly taking advantage of. Believing that the prosperity of a city depends upon the intelligence of its people, active and untiring efforts were made to secure these institutions. As is to be expected in a city of schools, Salina has many churches, and the local organizations are progressive and prosperous.

ARKANSAS CITY.

Population, 8,347. With the opening of the Cherokee strip, Arkansas City becomes at once a most important point. It is a thriving, busy place already, and the impetus which will be given it by the settlement of the new lands, will unquestionably increase its commercial importance.

A canal five miles long, running through the city, from the Arkansas to the Walnut rivers, affords a 15,000 horse power, which can easily be increased by enlarging this canal, and which already places the city at the front as a manufacturing center. The factories which depend on the canal for their power are the City Roller Mills, with a capacity of 300 barrels a day; the Plummer Chair Factory, Kirkwood Wind-mill Factory, mattress factory, Canal Planing Mills and electric light works.

FARM SCENE, KANSAS.

The city also contains the Danks Foundry and Machine Shops, two wholesale groceries and one wholesale dry goods store, one hotel building which costs $125,000, another $45,000, and an opera house building worth $75,000. This gives an idea of the business buildings of the city, and it must be inferred that other business buildings, which are numerous, compare favorably with those named. All the best buildings are built of cut stone which is quarried a few miles from town.

NEWTON.

Population, 5,605. County seat of Harvey county. It is a junction point on the Missouri Pacific and Atchison railroads.

Among the prominent industries of the city may be mentioned the roller mills, with a capacity of from 300 to 400 barrels per day; the cornice works and the carriage and buggy works, specimens of their handiwork being met with all over the West as far as the Pacific Ocean. There are two national banks and one private bank, transacting a business of $400,000 per annum. Thirteen churches are established here, including the various organizations of Presbyterians, Catholics, Methodists, Baptist, Episcopal, Mennonite, Evangelists and Lutherans. Three public school buildings, costing $85,000, furnish all the requisites for a common school education, while a higher grade will be afforded by the Bethel College, now in course of construction.

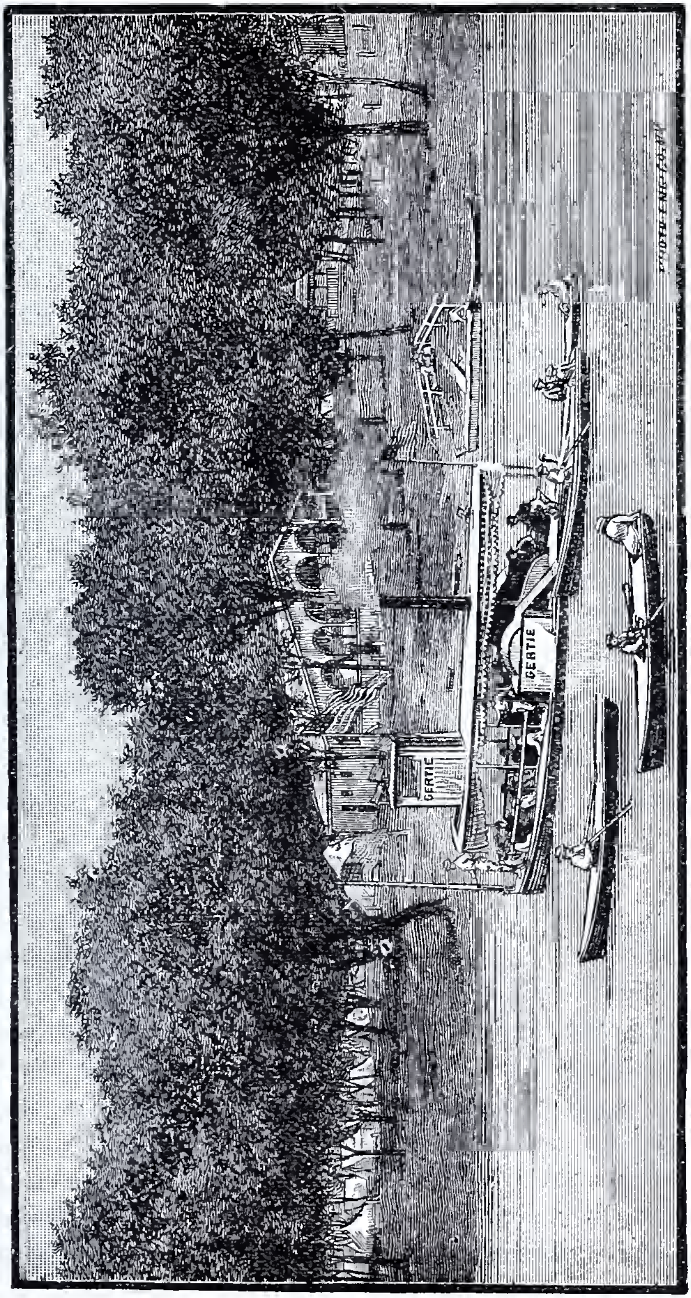
OSAWATOMIE.

Population, 2,662. The Kansas State Insane Asylum is located at this place. It is a magnificent structure, has over five hundred inmates, and gives employment to over eighty officers and attendants.

Natural gas has been developed by the Pennsylvania Gas and Mining Company. Several wells have been put down, and at a depth of four hundred feet a splendid flow has been found, which is of sufficient quantity that the city and also the asylum are supplied with fuel.

OTTAWA.

Population, 6,248. The Santa Fe repair shops are located here, with large and commodious buildings, round houses, etc., employing two hundred men; an oil and paint mill of fair capacity; three grain elevators, two foundries, two planing mills, and a soap factory. The Santa Fe Hospital has a capacity for sixty patients. "Forest Park" is the pride of the city. It is splendidly improved, and fitted up with buildings of various kinds, wherein are held the county fair and the widely known Chautauqua Assembly. There are four graded schools, with commodious buildings of twelve rooms each; also a Baptist University, with a full college course. Ottawa is literally a "City of Churches," there being sixteen church buildings.



FOREST PARK, OTTAWA, KANSAS.

WINFIELD.

Population, 5,184. Situated on an elevated plateau, in a rich agricultural county, Winfield commands the trade of a wide district, and is steadily advancing in commercial importance. Nine railroads center here. The city has all the modern conveniences—gas, water works, electric lights, street railways, etc.—and is especially well provided with educational facilities in the Southwest M. E. College and well conducted public schools. Here meets each year, in one of the most beautiful parks, the Chautauqua Assembly. All the religious denominations are represented and have commodious places of worship. In addition to the various manufacturing enterprises, a source of wealth is connected with the stone interest. The magnesia limestone, which is here in unlimited abundance, is pronounced the best for building and other purposes of any in the State. It is obtained with little labor and shipped to all points. Winfield is ornamented with it in her palatial buildings, and over seventy miles of flagging has been used in laying sidewalks. The Walnut river, upon which our excellent water works system is located, furnishes power to run a vast quantity of machinery and is a clear stream abounding in excellent food fish of various kinds. By this stream the city is furnished with perfect drainage, which aids in making it one of the healthiest localities known.

The population is American—intelligent and moral. having every attraction for the highest type of home-life.

ANTHONY.

Population, 1,806. County seat of Harper county.

It is situated at the junction of the Missouri Pacific and the Hutchinson & Southern, and at the western termination of the 'Frisco railroad, thus securing outlets to points north, northeast, east and southeast. The Hutchinson & Southern Railroad is a feeder for the Union Pacific, and its southern prospective point is Galveston, Texas. The district adjacent to the ground on which the city is built is an open, gently undulating prairie, with a fertile soil, suitable for the cultivation of all cereals, but producing chiefly at present good crops of wheat, oats and corn. The succulent grasses, along with the plentiful supply of water, render this one of the finest cattle raising districts in the State.

The salt industry, one of the natural resources of Anthony, is treated elsewhere in this volume.

IRRIGATION.

A great deal has been said and written lately about the possibilities of irrigation in Western Kansas. After carefully examining a number of articles on this subject in Federal and State reports the following from the pen of Robert Hay, chief geologist of the United States artesian and underflow investigation, has been selected as furnishing the best information available for a work of this character:

"Finney, Gray, Ford and Hamilton counties are usually referred to as containing the irrigation region of Kansas. This is correct; and Garden City may be considered the irrigation center. And yet, there was irrigation in Kansas before the three more western of these counties were organized, nearly a decade before Garden City was born. In 1873 George Allman settled on the south bank of the Smoky Hill, a mile or two above Fort Wallace. One of the first improvements he made was to construct a ditch about a mile long, and, by the aid of a small dam, tap the first permanent water of that river. In proving up his claim, the dam, ditch and laterals were among the improvements he described. He grew cabbages, potatoes, onions, and other garden stuff, which he sold at the fort, and wheat, alfalfa, and fruit have also received and repaid his attention. Mr. Allman has always done well on his farm, but last year a neighbor across the river made a larger dam higher up and took his water. As Kansas law on the subject is meager, and there is no local official to enforce it, Mr. Allman was in great difficulty when I saw him in June. What the outcome was I have not heard. Professors from more than one of our State institutions have camped on the Smoky river in this neighborhood during their summer explorations, but none have thought this ditch, now eighteen years old, worthy of any report. A change has taken place. Not only Western Kansas, but the middle and eastern sections of the State, are talking about irrigation now. Not only is the Arkansas valley being irrigated in the counties mentioned above, but streams like the Republican, Sappa, the Prairie Dog, and the Cimarron are being utilized for this purpose. A small stream like Brush creek, in Graham county, has been dammed so as to irrigate twenty-five acres directly, by Mr. Nathan Krank, and about as much more is benefited by sub-irrigation from the pool above the dam. A small stream known as Spring creek, in Meade county, has been used to water four hundred acres on the Crooked L ranch, and in the same county, and in Hamilton, some irrigation has been done by artesian wells, on an aggregate of about one hundred acres.

"This meeting of the State Board of Agriculture devoting this time to the subject of irrigation is another proof of the changed tendency of public opinion on this subject, and the fact that the National Congress intrusted an investigation of this matter to the Secretary of Agriculture last spring, which is being continued through this winter, shows the extent to which national interest in the development of the region of the Great Plains has extended. (The report of the summer work is now printed as a Senate document of the Fifty-first Congress, No. 222.)

" We wish to contribute a little now to the store of facts, a knowledge of which will help to solve the question of the possibility of saving Western Kansas to settlement by the use of irrigation. By Western Kansas we mean particularly all that part lying between the 99th and 102d meridians ; that is, about 32,000 square miles. But, though this region is designated, yet much of what will be said is true of the region adjoining for sixty or eighty miles further east, and of neighboring parts of Nebraska, Colorado and No Man's Land.

"If the question be asked, is irrigation possible in Western Kansas? the answer, that the large ditches of the Garden City district and the smaller ones above mentioned exist, is an affirmative answer, but it is not a sufficient one. The area in question is over twenty million acres ; the area irrigated by all existing means is not more than a tenth of one million. The real question is, can irrigation agencies be extended fifty fold or even twenty fold? If *yes*, then Western Kansas as a whole may become an agricultural region. If *no*, then the bulk of it must be relegated to pastoral occupations. Perhaps when we are through, agriculturists and the holders of Western mortgages may take a hopeful view.

" All the region indicated forms part of the *great plains*. There are no mountains, and the hills of erosion are comparatively few. But there are numerous valleys—valleys of erosion – cut out of the body of the plains. We have, then, two diverse topographic features which characterize the region, viz.: the *valleys* and the flat or rolling *table lands* which separate the valleys. At the eastern part of the region the valleys have their greatest size. They are broad and deep, while the plateaus are elongated easterly, with decreasing width. To the west the valleys are less deep and have less running water, while the divides merge into widely extended plains.

"With one exception, all the rivers that make and flow through these valleys have their origin in the plains. They are not mountain streams.

RANCH HOUSE, WESTERN KANSAS.

The one exception is the Arkansas. Its head waters are mountain torrents, which gather their waters from melting snows of the Rocky Mountains. There is always water in the Arkansas in spring and early summer. We shall not discuss here whether the amount in the visible stream is enough for the irrigation of all the acres already under ditch and the ditches yet to be constructed. This year the Sangre de Christo range, and the high mountains around the Royal Gorge, and those about the torrents that form the Fountain, are white with snow, and there is reason to expect this coming season all the ditches dependent on the Arkansas and its mountain-fed affluents will be filled for the fertilization of the land. We shall leave the Arkansas valley out of this discussion, except that we may incidentally refer to it in connection with the question of subterranean waters.

"The other rivers, then, are all rivers of the plains. They have their source and course there.

"We narrow down our inquiry, therefore, and state it thus: Is there water within reach, available for the irrigation of the valleys of these rivers of the plains, and the high prairie, the plateaus between them?

"First, with regard to the valleys. Let us name them, using for them the names of the rivers which run through them. The Arickaree, or Middle Fork of the Republican, the South Fork of the Republican, the two Beavers, the Sappa, the Prairie Dog, the two Solomons, the Saline, the Smoky Hill, the Walnut, the Whitewoman, the Cimarron, and the Medicine. The visible water in these streams is not enough to irrigate any large part of the first and second bottom lands of the valleys of more than three of them, viz.: the South Fork of the Republican, the Smoky and the Cimarron. It is only the first and last of these three which have visible water available at the State line. The Smoky has no visible water till more than a dozen miles within the State. One or two of its affluents show water a little further west. The Saline has no water further west than the east line of Thomas county. The Solomons about the same longitude. The Sappa and the Prairie Dog have only water in two counties. The Whitewoman rarely shows any water at all. The Walnut and Sawlog not much west of the 100th meridian, and the Medicine very little west of the 99th

"In many places these valleys are narrow and with steep banks, and the visible water could only with difficulty be led out to irrigate bottom lands. Still, many areas of from fifty to five hundred acres on these streams can be irrigated with the visible water, and more can be used for the irrigation of smaller areas from five to fifteen acres each. In places where it would be expensive to lead out the water to the land, it can be made to serve considerable areas by making an inexpensive dam that will back the water up for from half a mile to two miles, and so, by percolation, sub-irrigate the bottom land adjacent. A series of three such dams on the Prairie Dog, in Decatur county, in this way is making sure crops on about 100 acres of that valley. A similar dam above Oberlin, in the same county, is utilizing in the same way the waters of the Sappa. The dam at Norton Mill, Norton county, has also made fruitful a large field in the same way, and a similar case is seen on the North Solomon, near Edmund. This method is available not only on these streams, but in the valleys of small creeks, and in short ravines supplied by springs.

"The largest of these streams would undoubtedly irrigate thousands of acres by ordinary ditches, if proper conservation of waters by local reservoirs were properly attended to.

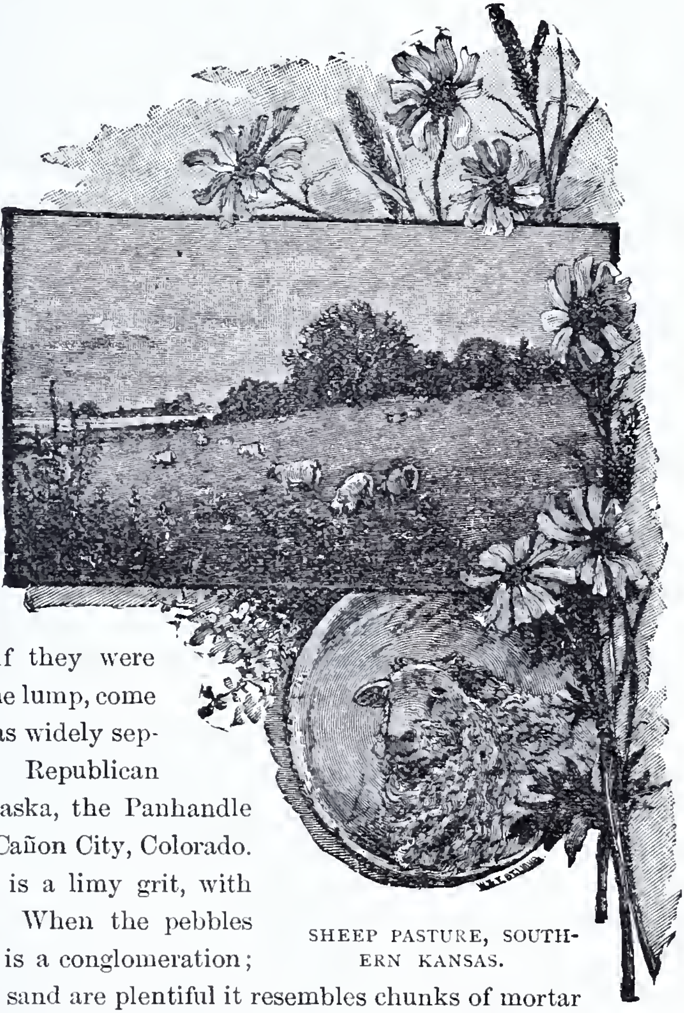
"These river-beds, above the points we have named as having first water, are almost altogether beds of sand or gravel which swallow up at once all the rainfall and only show wetness after the heaviest storms. Digging in the sand and gravel shows water at small depths in the dryest seasons. This water can be led out in ditches or pumped up and so used for irrigation. For these valleys this water may be called the *underflow*. It probably also exists under the river bottoms lower down the streams, and may there also be utilized for irrigation as well as the surface-flow. How much of this underflow there is in these valleys is at present unknown. It depends on the width of the valley, the quantity (depth) of the sand or gravel that contains it, or in other words, the depth to bed-rock, the chalk or the shale which bounds it. There is certainly a quantity which in every valley would irrigate hundreds of acres in each county in which these valleys are. In the valley of the Arkansas the underflow has been tested and utilized at Dodge City and at Hartland. With the slope of that valley it appears to yield fifteen cubic feet of water per second in a sub-flow ditch a mile long reaching to six feet below the water-level. It also appears to draw the water from five hundred feet on each side the ditch. In the valley of the Platte in Nebraska similar results are obtained with the underflow. In the valley of the Fountain river, eighteen miles above Pueblo, a good stream is brought to the surface in less distance because of the greater slope of the valley. Without a long, costly underground ditch it is doubtful whether the underflow can be tapped, even in the larger valleys of Kansas, in sufficient volume to flow into extended ditches that would reach the high prairie outside the valleys. On the other hand, there is no doubt that, even in the smaller valleys, much water may be obtained and used to irrigate a large proportion of the valley slopes. Some of the long ditches supplied from the surface-waters of the mountain-fed Arkansas lead waters out of the valley to irrigate the upland plateau. It is doubtful whether the surface-waters or these with the waters of the underflow of any other river in Kansas can be led out to the neighboring plateaus.

"The question then recurs, How can the plains proper—the plateaus between the rivers—be irrigated?

"Many thousands of settlers have taken land on these prairies. Many hundreds of wells have been dug, or bored, for water. It has been observed that the wells on a particular divide or plateau have about the same depth. Thus, the wells between the Sappa and the Prairie Dog, on the high prairie, reach water at about a depth of eighty feet. On the divide between the two Cimarrons, in the southwest, the depth is also about eighty feet for wells, over an extent of sixty miles. On the plain of Western Meade county, wells are from 150 to 165 feet deep. This uniform depth over a given area justifies the use of the term *sheet-water*. That is, water is found in a layer or sheet of porous material, sand, gravel, or conglomerate. The similarity of depth on the same plateau shows the same water-bearing stratum, but there are irregularities in depth and in the quantity of water, that show that the stratum is not absolutely uniform, and though, in nine cases out of ten, water will be found as expected, yet the tenth well sometimes is a failure. The causes of these phenomena, after a study of them for more than seven years, have become sufficiently plain to the writer. They cannot here be fully expounded. They have been referred to in other articles published by the State Board in several reports.

"We note one important fact. Notwithstanding the occasional failure of a well, the existence of a large body of water under each plateau is undoubted. Of the vast number of wells on the prairies, there are very few that under the heaviest strain show signs of exhaustion. Some railway wells are unexhausted by horse or steam pumps. Is, then, this water sufficient to be used for irrigation? We believe it is. Let it be understood that a man and his family can *not* farm 160 acres under irrigation. And also let it be understood, that if he can irrigate five acres he can live, and if he can irrigate twenty acres he can grow rich. If, then, water to irrigate five acres and upwards on every quarter-section can be obtained on the quarter-section, the farmer can live through the driest years, and in wet years the rest of his farm will produce, as we know, abundantly. Powerful wind-mills attached to these high-prairie wells, would fill reservoirs that could be scraped out on the highest part of the farm, which would enable a few acres of alfalfa, sorghum, orchard, or cabbages to be watered at the critical time in June or July, and so save the livelihood of the family.

"The source of this water—the sheet-water under the plains and the surface and sub-flow of the valleys, excluding the Arkansas—is the same.



SHEEP PASTURE, SOUTHERN KANSAS.

"The formation holding the water of the wells is one which, while having certain variations, is remarkably uniform over wide areas. Specimens, that seem as if they were parts of the same lump, come from localities as widely separated as the Republican valley in Nebraska, the Panhandle of Texas, and Cañon City, Colorado. The formation is a limy grit, with many pebbles. When the pebbles predominate it is a conglomeration; when lime and sand are plentiful it resembles chunks of mortar from an old wall, and we call it the "mortar-beds." When lime is the prevalent material, with little or no grit, it is in Kansas known as native lime; in New Mexico and Texas it has the Spanish name of *Tierra blanca*, or white earth. This last form is comparatively rare, though locally abundant, and the gritty forms are well known in the plains region. We may call it the plains grit, or, referring to its geological age, the tertiary grit. Seen a few times it is always easily recognized. It crops on the Cimarron, in Morton county, on the Arkansas, at Dodge City, on the Prairie Dog, Sappa, and Solomon, in Norton, Decatur and Graham counties, on the Whitewoman, in Greeley county, and in numerous other localities. On the high prairies it is buried under from twenty-five to one hundred and fifty feet of the *plains marl* (the smooth, uniform, fawn-colored subsoil of the plains), but on the edges of the valleys it often indicates its presence where its outcrop is not conspicuous. The gravels of the valleys and slopes are the weathered remains—the debris of the grit. It varies from forty to one hundred and fifty feet in thickness. Where it is well covered there is water all through it. Near the outcrop the water is near the bottom. Nearly all the springs of the regions come out of it or from under it off the limestones or shales which form the bed-rock just below it. Where the river valleys have cut through it they begin to have permanent water. There is no river of the plains which has constant running water till it has cut through the grit. Above that level the beds are the dry arroyos before described.

"This plains grit, then, is the immediate source of the waters of the region, the sheet-waters of the high prairie, the visible streams, springs and sub-flow of the valleys.

"We believe it is sufficiently abundant to irrigate from five to twenty acres on every quarter-section, and that is enough to make Western Kansas constantly prosperous.

"All subterranean waters have their origin in the atmosphere. The rains and snows of the plains region, which are not evaporated, find their way, by slow percolation, to the grit below, and are stored in its porous beds. It is for man to have the grit to raise them and use them on the land. Some beds of grit reach to the foothills of the Rocky Mountains; but it is not thence that the waters of the plains descend. The rainfall of western Kansas is forty to fifty per cent greater than that of the foothills region, and it is this rainfall that supplies the subterranean reservoirs of the West. Properly used, this subterranean supply will make the sub-arid region become the home of a numerous and prosperous people. So be it."

A FEW OF THE PROSPEROUS CITIES OF KANSAS.

POPULATION TAKEN FROM U. S. CENSUS, 1890.

Atchison	13,963
Great Bend	2,450
Fort Scott	11,946
Hiawatha	2,486
Horton	3,316
Eldorado	3,339
Columbus	2,160
Galena	2,496
Weir City	2,138
Clay Center	2,802
Concordia	3,184
Burlington	2,239
Arkansas City	8,347
Winfield	5,184
Girard	2,541
Pittsburgh	6,697
Abilene	3,547
Lawrence	9,997
Ellsworth	1,620
Garden City	1,490
Dodge City	1,763
Ottawa	6,248
Junction City	4,502
Eureka	2,259
Anthony	1,806
Harper	1,579
Newton	5,605
Holton	2,727
Olathe	3,294
Kingman	2,390
Chetopa	2,265
Oswego	2,574
Parsons	6,736
Lansing	1,468
Leavenworth	19,768
Emporia	7,551
McPherson	3,172
Marion	2,047
Peabody	2,118
Marysville	1,913
Paola	2,943
Beloit	2,455
Cherryvale	2,104
Coffeyville	2,282
Independence	3,127
Council Grove	2,211
Seneca	2,032
Chanute	2,826
Burlingame	1,472
Osage City	5,469
Scranton	1,572
Larned	1,861
Wamego	1,473
Nickerson	1,662
Hutchinson	8,682
Belleville	1,868
Lyons	1,754
Sterling	1,641
Manhattan	3,004
Salina	6,149
Wichita	23,853
Topeka	31,007
Caldwell	1,642
Wellington	4,391
Washington	1,613
Fredonia	1,515
Neodesha	1,528
Kansas City	38,316
Argentine	4,732

MISSOURI PACIFIC RAILWAY

THE

"Colorado Short Line"

RUNS

SOLID TRAINS,

EQUIPPED WITH

RECLINING CHAIR CARS (Seats Free,)
AND PULLMAN BUFFET SLEEPING CARS,
OR PARLOR CARS,

LEAVING **ST. LOUIS** DAILY

AND RUN

THROUGH VIA KANSAS CITY,

TO

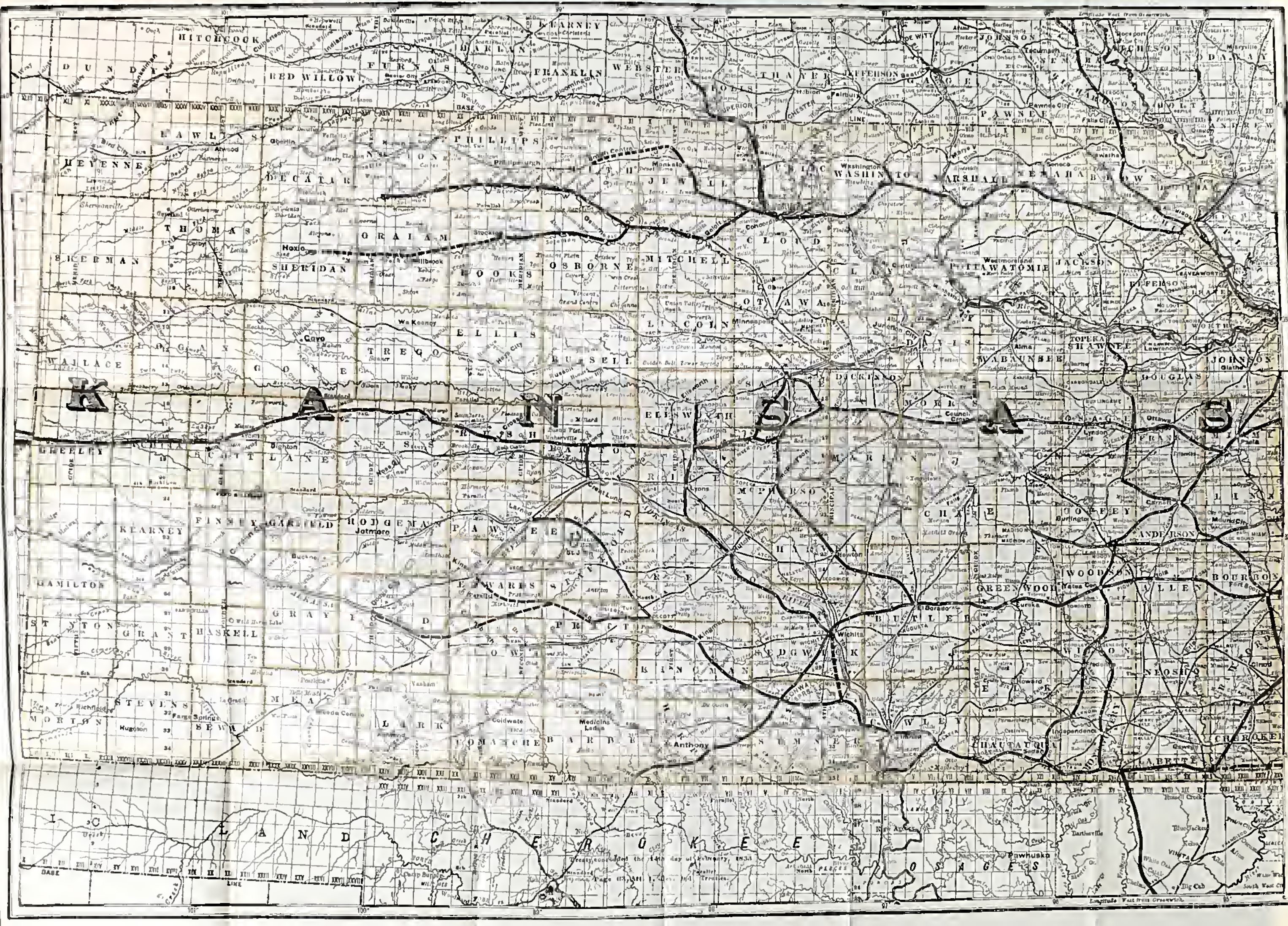
PUEBLO AND DENVER,

AND IN CONNECTION WITH THE U. P. FOR

OGDEN AND SALT LAKE CITY

WITHOUT CHANGE.

Choice of Two Routes. ∴ ∴ ∴


K A N S A S
HITCHCOCK
DUNDY
RED WILLOW
FURNAS
HARLAN
FRANKLIN
WEBSTER
KEARNEY
THAYER
JEFFERSON
GAGE
JOHNSON
PAWNEE
RICHARDSON
NEMAHA
RAWLINS
CHEYENNE
DECATUR
NORTON
PHILLIPS
SMITH
JEWELL
REPUBLIC
WASHINGTON
MARSHALL
NEMAHA
BROWN
DONIPHAN
THOMAS
SHERMAN
SHERIDAN
GRAHAM
ROOKS
OSBORNE
MITCHELL
CLOUD
CLAY
RILEY
POTTAWATOMIE
JACKSON
ATCHISON
JEFFERSON
LEAVENWORTH
WYANDOTTE
WALLACE
LOGAN
GOVE
TREGO
ELLIS
RUSSELL
LINCOLN
OTTAWA
DICKINSON
DAVIS
WABAUNSEE
SHAWNEE
DOUGLAS
JOHNSON
GREELEY
WICHITA
SCOTT
LANE
NESS
RUSH
BARTON
ELLSWORTH
SALINE
MORRIS
LYON
OSAGE
FRANKLIN
MIAMI
RICE
McPHERSON
MARION
CHASE
COFFEY
ANDERSON
LINN
HAMILTON
KEARNEY
FINNEY
GARFIELD
HODGEMAN
PAWNEE
STAFFORD
RENO
HARVEY
BUTLER
GREENWOOD
WOODSON
ALLEN
BOURBON
STANTON
GRANT
HASKELL
GRAY
FORD
EDWARDS
KIOWA
PRATT
KINGMAN
SEDGWICK
ELK
WILSON
NEOSHO
CRAWFORD
MORTON
STEVENS
SEWARD
MEADE
CLARK
COMANCHE
BARBER
HARPER
SUMNER
COWLEY
CHAUTAUQUA
MONTGOMERY
LABETTE
CHEROKEE
Topeka
Lawrence
Wichita
Hutchinson
Newton
El Dorado
Emporia
Salina
Abilene
Junction City
Manhattan
Atchison
Leavenworth
Ottawa
Paola
Fort Scott
Girard
Independence
Winfield
Wellington
Anthony
Kingman
Medicine Lodge
Coldwater
Dodge City
Larned
Great Bend
Hays City
Russell
Ellsworth
Minneapolis
Concordia
Beloit
Mankato
Phillipsburgh
Norton
Oberlin
Atwood
Bird City
Colby
Hoxie
Stockton
Osborne
Lyons
McPherson
Burlington
Garnett
Yates Centre
Eureka
Howard
Fredonia
Sedan
Hugoton
Richfield
Cove
Jetmore
Council Grove
Alma
Holton
Seneca
Marysville
Washington
Hiawatha
Troy
Olathe
Lyndon
Mound City
Superior
Red Cloud
Beatrice
Falls City
I N D I A N
L A N D
C H E R O K E E
O S A G E S
Pawhuska
Vinita
Bartlesville
Treaty concluded the 14th day of February, 1833
BASE LINE
Longitude West from Greenwich
101°
100°
99°
98°
97°
96°
95°

VALUABLE ASSISTANCE.

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Or they may be addressed as follows:

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ST. LOUIS, MO.

MISSOURI PACIFIC RAILWAY

THE

GREAT SOUTHWEST SYSTEM,

CONNECTING THE COMMERCIAL CENTRES AND RICH FARMS OF

MISSOURI,

THE BROAD CORN AND WHEAT FIELDS AND THRIVING TOWNS OF

KANSAS,

THE FERTILE RIVER VALLEYS AND TRADE CENTRES OF

NEBRASKA,

THE GRAND, PICTURESQUE AND ENCHANTING SCENERY, AND THE FAMOUS MINING DISTRICTS OF

COLORADO,

THE AGRICULTURAL, FRUIT, MINERAL AND TIMBER LANDS, AND FAMOUS HOT SPRINGS OF

ARKANSAS,

THE BEAUTIFUL ROLLING PRAIRIES AND WOODLANDS OF THE

INDIAN TERRITORY,

THE SUGAR, COTTON AND TIMBER PLANTATIONS OF

LOUISIANA,

THE COTTON AND GRAIN FIELDS, THE CATTLE RANGES AND WINTER RESORTS OF

TEXAS,

HISTORICAL AND SCENIC

OLD AND NEW MEXICO,

AND FORMS WITH ITS CONNECTIONS THE POPULAR ROUTE TO

ARIZONA AND CALIFORNIA.